

Internet of Things with Industrial Application

Objective: To introduce the concepts of IOT (Internet of Things) with Industrial Applications

Pre-requisites: Python, Embedded C and Basics of Circuit Theory, Electronics Circuits and Devices

Session 1 and 2

- Defining IOT
- Characteristics of IOT
- Physical Design of IOT
- Sensing, Actuation, Communication Models, Introduction to API
- Various type of industrial sensors
- Wireless medium access

Session 3

- Networking, Networking model for IOT
- Sensor Networks
- Wireless Medium Access
- MAC Protocol
- Sensor Deployment

Session 4

- Interoperability in IOT
- Various type of Interprobabilites of IOT
- Various type of Actuators used with Arduino
- Machine to Machine Communications
- Difference between M2M and IOT
- Study of different types of sensors and their data sheets
- Various type of sensors used with Arduino
- Study of Actuators and their data sheets

Session 5

- Introduction to UNIX & Embedded C
- Introduction to Python Programming
- Embedded C

Session 6

- Introduction to Raspberry Pi Part-1
- Hardware Interfacing of Raspberry Pi
- What is development board, how to install a development board
- Scratch, Python, Node JS, Theano
- Programming for interfacing of various sensors and actuators with raspberry pi
- Various techniques for controlling raspberry pi from remote location
- Application of raspberry as IOT

Session 7

- Introduction to Remote Access of PI
- Remote Access of PI using API
- Remote Access of PI using MQTT

Session 8

- Introduction to SDN
- SDN for IOT
- Sensor digital network
- Data Handling and Analytics

Session 9

- Communication Protocols
- Communication Protocols for IOT
- Socket Programming, MQTT, CoApp, Protocol for Pi and Arduino
- Node Red over IBM Blue mix

Session 10

- Industrial IOT-Application Domains
- Healthcare, Power Plants, Inventory Management & Quality Control
- Plant Safety and Security (Including AR and VR safety applications)
- Facility Management
- Design Challenges
- Security Challenges

Session 11 (Project Work)