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POSITIVE QUADRANT
T E C H N O L O G I E S
SERVING INFORMATION WORLDWIDE

INFORMATION TECHNOLOGY
ENGINEERING

IT ENGINEERING SEM VII
INTERNET OF EVERYTHING

Programming & development

Course Curriculum

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INTERNET OF EVERYTHING SEM VII

Module 1 : Introduction to IOT

- Defining IoT
- Characteristics of IoT
- Conceptual Framework of IoT
- Physical design of IoT
- Logical design of IoT
- Functional blocks of IoT
- Brief review of applications of IoT
- Smart Object
  - ➢ Definition
  - ➢ Characteristics and Trends

Module 2: IoT Architecture

- Drivers Behind New Network Architectures
  - ➢ Scale
  - ➢ Security
  - ➢ Constrained Devices and Networks
  - ➢ Data
  - ➢ Legacy Device Support
- Architecture
  - o The IoT World Forum (IoTWF) Standardized Architecture
    - ➢ Layer 1-7
    - ➢ IT and OT Responsibilities in the IoT Reference Model
    - ➢ Additional IoT Reference Models
    - ➢ A Simplified IoT Architecture
    - ➢ The Core IoT Functional Stack
    - ➢ Layer 1-3
    - ➢ Analytics Versus Control Applications
    - ➢ Data Versus Network Analytics Data Analytics Versus Business Benefits
    - ➢ Smart Services
- IoT Data Management and Compute Stack
  - ➢ Fog Computing
  - ➢ Edge Computing

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➢ The Hierarchy of Edge
➢ Fog
➢ Cloud

Module 3: Principles of Connected Devices and Protocols in IoT

- RFID and NFC (Near-Field Communication)
- Bluetooth Low Energy (BLE) roles
- LiFi
- WPAN std : 802.15 standards: Bluetooth
- IEEE 802.15.4
- Zigbee
- Z-wave
- Narrow Band IoT
- Internet Protocol and Transmission Control Protocol
- 6LoWPAN
- WLAN and WAN
- IEEE 802.11
- Long-range Communication Systems and Protocols
  ➢ Cellular Connectivity-LTE
  ➢ LTE-A
  ➢ LoRa and LoRaWAN

Module 4: Edge to Cloud Protocol

- HTTP
- WebSocket
- Platforms
- HTTP - MQTT
- Complex Flows
- IoT Patterns
- Real-time Clients
- MQTT
- MQTT-SN
- Constrained Application Protocol (CoAP)
- Streaming Text Oriented Message Protocol (STOMP)
- Advanced Message Queuing Protocol (AMQP)
- Comparison of Protocols

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Module 5: IoT and Data Analytics

- Defining IoT Analytics
- IoT Analytics challenges
- IoT analytics for the cloud
- Strategies to organize Data for IoT Analytics
- Linked Analytics Data Sets
- Managing Data lakes
- The data retention strategy
- visualization and Dashboarding-Designing visual analysis for IoT data
- creating a dashboard
- creating and visualizing alerts

Module 6: IoT Application Design

- Prototyping for IoT and M2M
- Case study related to
- Home Automation (Smart lighting, Home intrusion detection)
- Cities (Smart Parking)
- Environment (Weather monitoring, weather reporting Bot, Air pollution monitoring, Forest fire detection, Agriculture (Smart irrigation), Smart Library
- Introduction to I-IoT
- Use cases of the I-IoT
- IoT and I-IoT – similarities and differences
- Introduction to Internet of Behavior (IoB)