IVA035 - IoT Application Development

Course outcomes:

- Understand the basics of IoT.
- Implement the state of the Architecture of an IoT.
- Understand design methodology and hardware platforms involved in IoT.
- Understand how to analyze and organize the data.
- Compare IOT Applications in Industrial & real world.

Syllabus:

UNITI

Fundamentals of IoT

Evolution of Internet of Things, Enabling Technologies, M2M Communication, IoT World Forum (IoTWF) standardized architecture, Simplified IoT Architecture, Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects.

UNIT II

IoT Protocols

IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.11a and Lora WAN, Network Layer: IP versions,ConstrainedNodesandConstrainedNetworks,6LoWPAN,ApplicationTransport Methods:SCADA,ApplicationLayerProtocols:CoAPandMQTT.

UNIT III

Design And Development

Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks IoT Platform overview: Overview of IoT supported Hardware platforms such as: Raspberrypi, Arduino Board details

UNIT IV

Data analytics and supporting services

Data Analytics: Introduction, Structured Versus Unstructured Data, Data in Motion versus Data at Rest, IoT Data Analytics Challenges, Data Acquiring, Organizing in IoT/M2M.

Supporting Services: Computing Using a Cloud Platform for IoT/M2M Applications/Services, Everything as a service and Cloud Service Models.

UNIT V

Case studies/Industrial applications

IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments, Industry 4.0concepts.

Reference Text Books:

1. IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, Cisco Press, 2017
2. Internet of Things – A hands-on approach, Arshdeep Bahga, Vijay Madisetti, Universities Press, 2015
3. Internet of Things: Architecture, Design Principles And Applications, Rajkamal, McGraw Hill Higher Education.