## COURSE CONTENT IoT

**Introduction 8 hours**

Definitions and functional requirements, Motivation, Elements of an IoT ecosystem, Technology drivers, Business drivers, Trends and implications, Overview of Governance, Privacy and security Issues, Web 3.0 view of IoT, Ubiquitous IoT applications

**Sensors Networks 9 hours**

Definition, Types of sensors, Types of actuators, Examples and Working,

Wireless sensor networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

IoT Development Boards: Arduino IDE and Board Types, Raspberry Pi development kit, RFID principles and components,

**IoT Protocols 10 hours**

Protocol Standardization for IoT, M2M and WSN Protocols, SCADA and RFID Protocols, Issues with IoT Standardization, Unified Data Standards

Protocols, IEEE 802.15.4, BACNet Protocol, Modbus, KNX, Zigbee Architecture, Network layer, APS layer, Security.

**IoT Architecture 10 hours**

IoT Open-source architecture (OIC): OIC architecture & design principles, IoT devices and deployment models

IoTivity: An open source IoT stack, Overview, IoTivity stack architecture, Resource model and Abstraction.

Middleware for IoT: Overview, Communication middleware for IoT

SOA and Cloud computing, Cloud middleware, Cloud standards, Cloud providers and systems, Edge/fog computing

**Applications 8 hours**

Home Automation, Smart Cities, Energy, Retail management, Logistics, Agriculture, Health and lifestyle, Industrial IoT, IoT in environmental protection, Legal challenges, IoT design ethics.