COOE1 **FUNDAMENTALS OF IOT**

COURSE OBJECTIVES:

1. Understand the concepts of Internet of Things and able to build IoT applications
2. Learn the programming and use of Arduino and Raspberry Pi boards.
3. Known about data handling and analytics in SDN.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. Known basic protocols in sensor networks.
2. Program and configure Arduino boards for various designs.
3. Python programming and interfacing for Raspberry Pi.
4. Design IoT applications in different domains.

UNIT I [CO:1] **(12)**

Introduction to Internet of Things, Characteristics of IoT, Physical design of IoT, Functional blocks of IoT, Sensing, Actuation, Basics of Networking, Communication Protocols, Sensor Networks.Machine-to-Machine Communications, Difference between IoT and M2M, Interoperability in IoT

UNIT II [CO:2] **(12)**

Introduction to Arduino Programming, Integration of Sensors and Actuators with Arduino.Introduction to Raspberry Pi, Interfacing Raspberry Pi with basic peripherals, Implementation of IoT with Raspberry Pi.

UNIT III [CO:3] **(12)**

Implementation of IoT with Raspberry Pi, Introduction to Software defined Network (SDN), SDN for IoT, Data Handling and Analytics.

UNIT IV [CO:4] **(12)**

Cloud Computing, Sensor-Cloud, Smart Cities and Smart Homes, Connected Vehicles, Smart Grid, Industrial IoT, Case Study: Agriculture, Healthcare, Activity Monitoring.

LEARNING RESOURCES:

TEXT BOOK(s):

1. "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
2. "Make sensors": Terokarvinen, kemo, karvinen and villey valtokari, 1st edition, maker media,2014

REFERENCE BOOK(s):

1. Waltenegus Dargie,Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice".
2. Beginning Sensor networks with Arduino and Raspberry Pi , Charles Bell, Apress,
3. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti