**DS745PE: INTERNET OF THINGS (Professional Elective – IV)**

**B.Tech. IV Year I Sem.**                                                        L  T  P  C
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**Pre-Requisites:** Computer organization, Computer Networks
**Course Objectives:**
- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web-based services on IoT devices

**Course Outcomes:**
- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Identify the applications of IoT in Industry.

**UNIT - I**
**Introduction to Internet of Things** –Definition and Characteristics of IoT, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies, IoT Levels and Deployment Templates
**Domain Specific IoTs** – Home automation, Environment, Agriculture, Health and Lifestyle

**UNIT - II**
**IoT and M2M** – M2M, Difference between IoT and M2M, SDN and NFV for IoT,
**IoT System Management with NETCOZF, YANG-** Need for IoT system Management, Simple Network management protocol, Network operator requirements, NETCONF, YANG, IoT Systems Management with NETCONF-YANG

**UNIT - III**
**IoT Systems – Logical design using Python-**Introduction to Python – Python Data types & Data structures, Control flow, Functions, Modules, Packaging, File handling, Data/Time operations, Classes, Exception, Python packages of Interest for IoT

**UNIT - IV**
**IoT Physical Devices and Endpoints** - Raspberry Pi, Linux on Raspberry Pi, Raspberry Pi Interfaces, Programming Raspberry PI with Python, Other IoT devices.

**IoT Physical Servers and Cloud Offerings –** Introduction to Cloud Storage models and communication APIs, WAMP-AutoBahn for IoT, Xively Cloud for IoT, Python web application framework –Django, Designing a RESTful web API

**UNIT V**
**Case studies-** Home Automation, Environment-weather monitoring-weather reporting- air pollution monitoring, Agriculture.

**TEXT BOOK:**
1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.

**REFERENCE BOOK:**
1. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759.