

24CSH201: INTERNET OF THINGS

Hours/Week: 4

I.A. Marks: 30

Credits: 4

Exam. Marks: 70

Course Learning Objectives:

- Understand the concepts of Internet of Things
 - Analyze basic protocols in wireless sensor network
 - Design IoT applications in different domain and be able to analyze their performance
 - Implement basic IoT applications on embedded platform
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Course Outcomes: After completing the course, the students will be able to,

- Understand the impact of IoT applications and Architectures in real world
 - Realize the various IoT Protocols (Datalink, Network, Transport, Session, Service)
 - Differentiate between the levels of the IoT stack and be familiar with the key technologies
 - Interface different sensors to arduinouno and raspberry pi to read the environment data.
 - Appreciate the role of big data, cloud computing and data analytics in a typical IoT system
 - Provide an overview on the ICT ecosystem and enabling environment to foster IoT
 - To provide an understanding of the technologies and the standards relating to IoT.
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UNIT-I

12Hrs.

Introduction to Internet of Things – Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle, IoT challenges.

UNIT-II

12Hrs.

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with SNMP, NETCOZF, YANG- NETCONF and NETOPEER.

UNIT-III

12Hrs.

IoT Physical Devices and Endpoints -- Introduction to Arduino, Arduino UNO, Fundamentals of Arduino Programming: Interfacing Sensors and actuators with Arduino Uno. Introduction to Nodemcu, programming with Nodemcu, Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT-IV

12Hrs.

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application framework, Designing a RESTful web API.

REFERENCE BOOKS:

1. Arshdeep Bahga and Vijay Madisetti, Internet of Things - A Hands-on Approach, Universities Press, 2015, ISBN: 9788173719547
2. Matt Richardson & Shawn Wallace, Getting Started with Raspberry Pi, O'Reilly (SPD), 2014, ISBN: 9789350249759.

