



NARSIMHA REDDY ENGINEERING COLLEGE

An Autonomous Institution | Affiliated to JNTUH | Approved by AICTE
Accredited by NBA & NAAC with 'A' Grade

Department of Computer Science and Engineering

SYLLABUS

FUNDAMENTALS OF INTERNET OF THINGS (OE – I)

B.Tech. III Year II Sem.

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
23EC614	Open Elective	L	T	P	3	CIE	SEE	TOTAL
		3	0	0		40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: -				Total Classes:48		

Course Objectives: The objectives of the course are to:

- Make concepts of Internet of Things understandable to build IoT applications.
- Teach the programming and use of Arduino and Raspberry Pi boards.
- Provide Knowledge about data handling and analytics in SDN.

Course Outcomes: Upon completing this course, the students will be able to

- Know basic protocols in sensor networks.
- Program and configure Arduino boards for various designs.
- Python programming and interfacing for Raspberry Pi.
- Design IoT applications in different domains.

UNIT – I

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.

UNIT - II

Machine-to-Machine Communications: Difference between IoT and M2M, Interoperability in IoT, Introduction to Arduino Programming, Integration of Sensors and Actuators with Arduino.

UNIT – III

Introduction to Python programming: Introduction to Raspberry Pi, Interfacing Raspberry Pi with basic peripherals, Implementation of IoT with Raspberry Pi.

UNIT - IV

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

UNIT - V

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

TEXT BOOKS:

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 villeyvaltokari, 1st edition, maker media, 2014.
3. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti

REFERENCE BOOKS:

1. Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"
2. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice".
3. Beginning Sensor networks with Arduino and Raspberry Pi – Charles Bell, Apress, 2013