



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

## COURSE CONTENT

INTERNET OF THINGS											
VII Semester: CSE											
Course Code	Category	Hours / Week				Credits			Maximum Marks		
		L	T	P	C	CIA	SEE	Total			
24X0523	OE	3	0	0	3	40	60	100			
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45					
Prerequisites: Computer organization, Computer Networks											

### Course Overview:

This course introduces the fundamentals of Internet of Things (IoT), including architecture, enabling technologies, and communication models. It covers IoT applications in domains such as home automation, healthcare, agriculture, and environment. Students gain hands-on experience in developing IoT systems using Python, Raspberry Pi, and cloud platforms, supported by real-world case studies.

### Course Objectives:

1. To Introduce The Fundamental Concepts, Architecture, And Enabling Technologies Of The Internet Of Things (Iot).
2. To Familiarize Students With Domain-Specific Iot Applications In Areas Like Home Automation, Healthcare, Agriculture, And Environment.
3. To Explain Communication Protocols, System Management Tools, And Standards Essential For Iot And M2M (Machine-To-Machine) Interactions.
4. To Develop Students' Ability To Design And Implement Iot Systems Using Python And Physical Devices Such As Raspberry Pi.
5. To Expose Students To Real-World Iot Case Studies And Cloud-Based Iot Platforms For Data Storage, Visualization, And Remote Access.

### Course Outcomes: After Completion of the Course, Students should be able to

1. Explain physical and logical design of IoT systems, and identify suitable enabling technologies.
2. Differentiate between IoT and M2M communication.
3. Develop IoT system components using Python, including handling data types, files, modules, and relevant packages.
4. Interface IoT devices like Raspberry Pi and integrate them with cloud services for IoT-based applications.
5. Analyze IoT solutions across various domains such as smart homes, environment monitoring, and agriculture.

### MODULE – I [10]

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

## MODULE – II [10]

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

## MODULE – III [10]

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

## MODULE – IV [10]

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

## MODULE – V [8]

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

### TEXT BOOKS:

Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madiseti, Universities Press, 2015, ISBN: 9788173719547.

### REFERENCE BOOKS:

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

### ELECTRONIC RESOURCES:

1. <https://www.mygreatlearning.com/academy/learn-for-free/courses/what-is-iot>
2. <https://www.raspberrypi.com/learn/iot-for-beginners/>
3. <https://www.udemy.com/topic/internet-of-things/free/>
4. <https://www.youtube.com/watch?v=h0gWfVCSGQQ>

### MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)