GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3730308
Semester – III
IOT& its Application in Instrumentation

Type of course: Program Elective V

Prerequisite: Basic Programming Knowledge

Rationale: Students of Instrumentation & Control engineering should have detailed skill of controlling real time process control system. With Internet of Things (IoT) students can monitor as well control real time process parameter at local level as well as on remote server with cloud. This course gives a detailed knowledge and concept of modern instrumentation using IOT.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	00	00	100

Content:

Sr. No.	Content	Total Hrs
1	Introduction to IoT: Sensing, Actuation, Basics of Networking:	2
2	Communication Protocols	4
3	Sensor Networks	3
4	Machine-to-Machine Communications	3
5	Interoperability in IoT, Introduction to Arduino Programming: Integration of Sensors and Actuators with Arduino	6
6	Introduction to Python programming: Introduction to Raspberry Pi: Implementation of IoT with Raspberry Pi:	6
7	Introduction to SDN: SDN for IoT:	2
8	Data Handling and Analytics:	2

9	Cloud Computing, Sensor-Cloud	**2**
10	Fog Computing:, Smart Cities and Smart Homes:	**2**
11	Connected Vehicles, Smart Grid	**2**
12	Industrial IoT:, Case Study: Agriculture, Healthcare, Activity Monitoring:	**2**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**21**	**14**	**14**	**11**	

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy) Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
2. Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti (Universities Press) Research papers

Course Outcome:

After learning the course the students should be able to

Sr. No.	CO statement	Marks % weightage
1.	Understand the concept of Internet of Things.	25
2.	Analyze basic protocol in wireless sensor network.	25
3.	Design IOT applications in different domain.	25
4.	Implement basic IOT application on embedded platform.	25