GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Subject Code: ME03067011

Subject Name : IoT and its Applications in Instrumentation

WEF Academic Year:	2024-2025
Semester:	3
Category of the Course:	MOPEC-1

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.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level*
01	Understand the concept of Internet of Things.	UN
02	Analyze basic protocol in wireless sensor network.	AN
03	Design IOT applications in different domain.	EL
04	Implement basic IOT application on embedded platform.	CR

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Teaching and Examination Scheme :

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

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Introduction to IoT: Sensing, Actuation, Basics of Networking:	3	7
2	Communication Protocols	5	12
3	Sensor Networks 3	3	7
4	Machine-to-Machine Communications	3	7
5	Interoperability in IoT, Introduction to Arduino Programming: Integration of Sensors and Actuators with Arduino	8	17
6	Introduction to Python programming: Introduction to Raspberry Pi: Implementation of IoT with Raspberry Pi	8	17
7	Introduction to SDN: SDN for IoT	3	7
8	Data Handling and Analytics	3	7
9	Cloud Computing, Sensor-Cloud	3	7
10	Fog Computing:, Smart Cities and Smart Homes	2	4
11	Connected Vehicles, Smart Grid	2	4
12	Industrial IoT:, Case Study: Agriculture, Healthcare, Activity Monitoring	2	4
	Total	**45**	**100**

Reference Book:

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

List of Laboratory/Learning Resources Required:

1. NPTEL
2. Virtual Laboratory (vlab.co.in)

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