



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Internet of Things

Subject Code : ME02062091

Subject Name : Industrial IoT

w. e. f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisite:	Fundamentals of IoT, Sensors, Python, Sensors
Rationale:	Course includes knowledge of connecting machines, sensors, devices, and systems to the internet, enabling real-time data collection, analysis, and optimization which are key aspect of industrial IoT and Industry 4.0.

Course Outcome:

After completion of the Course, Students will be able to:

No	Course Outcomes	RBT Level*
01	Understand basics of Industrial IoT and Industry 4.0.	UN
02	Demonstrate various protocols of data transmission	AP
03	Apply machine learning algorithms on data	AP
04	Analyze performance of various buses for data transmission	AN
05	Analyze various tools for ML/AI	AN

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

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	30	30	20	150



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Course Content:

Sr No	Course Content	No of Hours	% of Weightage
1	UNIT 1 : Introduction to Internet of Things: IoT Architecture, Application-based IoT Protocols, Business Models of IoT, IoT reference architecture, Emerging IoT Technologies	6	15
2	UNIT 2 : Industry 4.0: Cyber Physical Systems and Next Generation Sensors, Collaborative Platform and Product Lifecycle Management, Augmented Reality and Virtual Reality, Artificial Intelligence, Big Data and Advanced Analysis, Cybersecurity in Industry 4.0, Basics of Industrial IoT.	8	20
3	UNIT 3 : Introduction to IIoT: Prerequisites of IIoT, Basics of CPS, CPS and IIoT, Modeling for CPS and CMS, Design requirements of Industry 4.0, Drivers of Industry 4.0, Industrial internet and sensing, Industrial processing.	8	20
4	UNIT 4 : Architecture of IIoT: Architecture of IIoT, IIRA framework, Categorization of IIRA frameworks, Business models of IIoT, Cloud Computing, Fog Computing, Augmented Reality, Virtual Reality, Big Data and Advanced Analytics, Lean manufacturing systems	8	20
5	UNIT 5 :Industrial Data Transmission: Sensors and Actuators, Foundation Fieldbus, Profibus, HART, Interbus, Bitbus, CC-Link, CC-Link, Modbus, Batibus, Controller Area Network, LoRa and LoRaWAN, Recent and Upcoming Technologies. Industrial Data Acquisition.	8	20
6	UNIT 6 :Machine Learning and Data Science in Industries: Introduction, Machine Learning, Categorization of ML, Applications of ML in Industries, Data Science in Industries, Deep Learning, Application of Deep Learning in Industries.	4	05
TOTAL		45	100

Reference Book:

- “Industry 4.0: The Industrial Internet of Things”, by Alasdair Gilchrist, Apress Publications, Latest Edition.



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- “Industrial Internet of Things: Cyber manufacturing Systems ”by Sabina Jeschke, Christian Brecher, Houbing Song, Danda B. Rawat, Springer Publications, Latest Edition
- “Introduction to Industrial Internet of Things and Industry 4.0”, by Sudip Mishra, Chandana Roy, CRC Press, Taylor and Francis Group of Publications, Latest Edition.
- “Industrial Internet of Things : Technologies and Research Directions”, by Anand Sharma, Sunilkumar Jangir, Manish Kumar, CRC Press, Taylor and Francis Group of Publications, Latest Edition.

Suggested Course Practical List:

- The practical work will be carried out based on the content covered during the academic session.

List of Laboratory/Learning Resources Required:

- List of Hardware: NIL
- List of Software: Python
- List of Open Source Tools/Simulator: Tesnorflow, Keras
- List of Useful websites/MOOCs: NIL
