

Branch Name:	Information and Communication Technology
Program Code:	ET107
Semester/Year:	Semester VII/ Fourth Year
Course Title:	Industrial Internet of Things
Course Code:	2ET1070702T
Pre-requisite Course:	Internet of Things, Communication and Networking, information security

Course Objective:

1. IoT will change industries and transform the way we work and live. Industrial companies are already pivoting from Products to Services leveraging IoT technologies – this digital transformation is more broadly called the Industrial IoT or Industrial Internet.
2. The objective of this subject is make students aware about this latest technology, its application and to identify future scope for better manufacturing system.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min	Max.	Mn	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Overview of Industry 4.0 and Industrial IoT: Introduction, Industry 4.0, IIoT, basics of CPS, CPS and IIoT, Applications of IIoT.	5	10
2	Industry 4.0: Introduction, design requirements of Industry 4.0, Drivers of Industry 4.0, sustainability assessment of industries, smart business perspective, cyber security, impact of Industry 4.0	5	10
3	Industrial Internet of Things: Introduction, industrial internet systems, industrial sensing, industrial processes, business models of IIoT, reference architecture of IIoT, IIRA, key performance indicators for occupational safety and health.	7	15
4	Key technologies – On site technologies: Introduction, AR, VR, Big Data and advanced analytics, smart factories, lean manufacturing system.	5	15
5	Key technologies – Off-site technologies: Introduction, cloud computing, fog computing.	5	10
6	Sensors & Actuators: Characteristics of Sensors, Sensor categories, Thermal actuators, Hydraulic actuators, Pneumatic actuators, Electromechanical actuators.	6	15

7	Industrial Data Transmission: Introduction, foundation Field bus, Profibus, HART, Inter bus, Bit bus, CC-link, Modbus, Batibus, Digital STROM, Controller Area Network, , LonWorks, ISA 100.11a, Wireless HART, LoRA and LoRaWAN, recent and upcoming technologies.	7	15
8	Industrial Data Acquisition: Introduction, distributed control system, PLC, SCADA	5	10

List of References:

1. Sudip Misra, Chandana Roy, Anandarup Mukherjee, Introduction to Industrial Internet of Things and Industry 4.0, CRC Press, Taylor & Francis, 2021
2. Sabina Jeschke, Christian Brecher Houbing Song , Danda B. Rawat, Industrial Internet of Things Cyber Manufacturing Systems, Springer, 2017
3. Alasdair Gilchrist, Industry 4.0: The Industrial Internet of Things”, Apress, 2017

E-Resources:

1. <https://www.coursera.org/learn/industrial-internet-of-things>
2. <https://www.techtarget.com/iotagenda/definition/Industrial-Internet-of-Things-IIoT>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand concepts of Industrial IoT, Industry 4.0 and their process.	2 Understanding
CLO2	Describe various technologies used in Industrial IoT	2 Understanding
CLO3	Demonstrate various sensors, actuators, and industrial data transmission used in the Industrial IoT.	2 Understanding 3 Applying
CLO4	Apply various industrial data acquisition techniques, safety and security measures in the Industrial IoT	3 Applying
CLO5	Analysis of challenges, issues and their solutions related to industries	4 Analyze

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes(POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1	M	L	H	L	M	M				M			H	L		
CLO2	M	L	M	M	M	M				M	L	L	M	L	M	
CLO3	H	M	M	L	M	H				L		L	M	H	M	M
CLO4	H	M	M	L	M	H		M	L				M	H		H
CLO5	H	M	M	H	M	H		M		L			M	H		

H:High, M:Medium, L:Low