



(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

S.P.G.Chidambara Nadar - C.Nagammal Campus

S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

## DEPARTMENT OF MECHATRONICS ENGINEERING

(Accredited by NBA, New Delhi)

“Endgame Systems Research” Industry Certified Value-Added Course on

### “Hands-on Industrial Internet of Things (IIoT)”

2025 – 2026 EVEN SEMESTER

Duration: 40 Hours

#### COURSE OBJECTIVES

1. To introduce the fundamentals of IoT and Industrial Internet of Things in industrial environments.
2. To understand industrial processes, automation hierarchy, and IIoT data flow.
3. To study industrial communication protocols, OPC UA, and edge computing concepts.
4. To analyze IIoT platform architectures using open-source and cloud-based solutions.
5. To develop practical skills for implementing IIoT solutions for industrial applications.

#### UNIT I: INTRODUCTION TO IOT AND IIOT (8 Hours)

Definition and evolution of IoT and IIoT, enabling technologies, IoT vs IIoT, safety and reliability, industrial use cases such as predictive maintenance, energy optimization, asset tracking and worker safety.

#### UNIT II: INDUSTRIAL PROCESSES AND AUTOMATION (8 Hours)

Industrial processes and control systems, CIM pyramid, batch, continuous and discrete processes, sensors, actuators, PLCs, DCS, microcontrollers, SCADA and historian systems, IIoT data flow.

#### UNIT III: INDUSTRIAL DATA FLOW AND COMMUNICATIONS (8 Hours)

Measurement and control chain, OSI model, industrial protocols, fieldbus technologies, SCADA, MES, ERP integration, ISA-95/ISA-88, historian databases.

#### UNIT IV: IIOT DATA FLOW IMPLEMENTATION AND EDGE COMPUTING (8 Hours)

OPC Classic vs OPC UA, OPC UA information and security model, edge computing, gateways, cloud connectivity, real-time streaming and deployment scenarios.

#### UNIT V: IIOT PLATFORMS AND CLOUD IMPLEMENTATION (8 Hours)

IIoT platform architecture, microservices, containers, Docker, time-series databases, open-source stack (MQTT, InfluxDB, Grafana), AWS IoT Core, Greengrass, SiteWise, mini project.

Total: 40 Hours



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### COURSE OUTCOMES

CO No.	Course Outcome	Knowledge Level
CO1	Explain the concepts and applications of IoT and Industrial IoT.	K2 – Understand
CO2	Identify industrial processes, automation systems and IIoT data flow.	K3 – Apply
CO3	Apply industrial communication protocols and OPC UA for data exchange.	K3 – Apply
CO4	Analyze edge, cloud and IIoT platform architectures.	K4 – Analyze
CO5	Design and implement a basic IIoT solution for an industrial application.	K3 – Apply

### PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Graduates will be able to apply their knowledge in sensors, drives, actuators, controls, mechanical design and modern software & hardware tools to design and develop cost effective Mechatronics systems.

PSO2: Graduates will be able to become Technocrats and Entrepreneurs, build the attitude of developing new concepts on emerging fields and pursuing higher studies.

### CO – PO – PSO MAPPING

H – High, M – Moderate, L – Low

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PSO1	PSO2
CO1	M	M	L	L	L	-	-	-	L	L	M	M	L
CO2	M	M	M	L	L	-	-	-	L	L	M	H	M

