AMPUSHWORKS ENTERPRISES PRIVATE LIMITED

Technical Training Programmes 2026–27

SYLLABUS

Industrial IoT and Sensor Technologies

Course information	
Programme	10. Industrial IoT and Sensor Technologies
Duration	One month
Total hours	102 hours (theory 32, practical 64, examinations 6)
Course fee	₹3,000 per candidate
Batch size	Minimum 10 candidates; batches scheduled after sufficient registrations
Eligibility	B.Tech, Diploma, ITI, B.Sc and BCA students, engineering graduates, working professionals and college faculty
Prerequisites	Basic electronics and basic IoT or microcontroller knowledge.

1. Course Introduction

Industrial IoT brings monitoring and data to factories, utilities and infrastructure. This course covers industrial sensors, standard signals, industrial communication and the integration of edge devices with cloud monitoring and alarms.

2. Course Objectives

On completing this course, candidates will be able to:

- Identify industrial sensors and their uses
- Work with standard signals such as 4–20 mA
- Use RS-485 and Modbus communication
- Integrate edge devices with cloud monitoring
- Design alarms and dashboards for industrial applications

3. Hours Distribution

Component	Hours
Theory classes (8 units × 4 hours)	32
Practical sessions (14 labs × 4 hours)	56
Mini project (practical)	8
Theory examination	2
Practical examination	4
Total programme hours	**102**

Practical sessions including the mini project total 64 hours (56 + 8). The examinations (6 hours) are held after completion of the training.

4. Theory Syllabus (32 hours)

Unit	Topics covered	Hours
Unit 1	INTRODUCTION TO INDUSTRIAL IOT • IIoT vs consumer IoT • Industry 4.0 concepts • Applications in plants and utilities	4
Unit 2	INDUSTRIAL SENSORS • Pressure, flow and temperature sensors • Current and energy measurement • Level and vibration sensing	4
Unit 3	SIGNALS AND CONDITIONING • 4–20 mA and 0–10 V signals • Signal conditioning and isolation • Calibration and accuracy	4
Unit 4	INDUSTRIAL COMMUNICATION • RS-485 basics • Modbus RTU: registers and polling • Introduction to Modbus TCP	4
Unit 5	EDGE DEVICES AND CONTROLLERS • Gateways and edge controllers • Reading field instruments • Local logic and buffering	4
Unit 6	CLOUD MONITORING • Sending data to the cloud • Dashboards for operations • Data storage and reports	4
Unit 7	ALARMS AND EVENTS • Alarm thresholds and priorities • Notifications by SMS and email • Event logs	4
Unit 8	SYSTEM INTEGRATION AND RELIABILITY • Power, enclosures and environment • Cyber-security basics • Case study: utility monitoring system	4

5. Practical Sessions (64 hours)

Lab	Practical assignment	Hours
1	Identify industrial sensors and wiring	4
2	Read a 4–20 mA sensor	4
3	Signal scaling and calibration	4
4	Measure current and energy	4
5	RS-485 wiring and termination	4
6	Read a Modbus RTU device	4
7	Write and read Modbus registers	4
8	Configure an edge gateway	4
9	Send industrial data to the cloud	4

Lab	Practical assignment	Hours
10	Build an operations dashboard	4
11	Configure alarms and notifications	4
12	Event logging and reports	4
13	Enclosure and power design exercise	4
14	Fault-finding in an IIoT set-up	4
MP	Mini project: Industrial monitoring system: multiple sensors over 4–20 mA and Modbus, edge gateway, cloud dashboard and alarms.	8
	Total practical hours	**64**

6. Mini Project

Project: Industrial monitoring system: multiple sensors over 4–20 mA and Modbus, edge gateway, cloud dashboard and alarms.

Each candidate (or small group) plans, builds, tests and documents the project during the final practical sessions, and presents it during the practical examination.

7. Hardware, Tools and Software

- Industrial pressure, temperature and current sensors
- 4–20 mA signal sources and converters
- RS-485/Modbus modules and energy meters
- Edge gateways, ESP32 boards and a cloud IoT platform

8. Learning Outcomes

By the end of the course, candidates will be able to:

- Connect industrial sensors and read standard signals
- Communicate with devices using Modbus
- Integrate edge devices with cloud dashboards
- Design alarms for industrial monitoring

9. Assessment and Certification

Examination	What is assessed	Duration
Theory examination	Understanding of concepts, components and principles covered in the 8 units	2 hours
Practical examination	Ability to build, wire, program, test and fault-find; presentation of the mini project	4 hours

Practical assignments completed during the course are also reviewed as part of the practical assessment.

A **training completion certificate** will be issued subject to successful completion of the programme and assessment requirements.

10. Enrolment and Contact

To enrol, send your name, mobile number, college or organisation, course and year, and the name of this programme to Ampushworks. You will be informed when your batch is scheduled.

Contact	Details
Address	Priyadarshi Nagar, Bhagwat Nagar, Patna, Bihar – 800026
Website	https://ampushworks.com
Registration form	https://www.ampushworks.com/training.html#register
Email	support@ampushworks.com
Phone	+91 94702 13936
WhatsApp	+91 94702 13937

Note: This syllabus may be updated by Ampushworks to reflect new technology and equipment. The syllabus issued at the start of a batch applies to that batch.