

# Lesson Plan: IoT Fundamentals

**Course:** B.Tech CSE (Artificial Intelligence)  
**Semester:** 3rd (2nd Year)  
**Duration:** 1 Hour  
**Instructor:** Dr Swapandeep Kaur  
**Topic:** Introduction to IoT (Internet of Things)

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## SMART Learning Objectives

By the end of the session, students will be able to:

SMART Criteria	Objective
Specific	Define IoT and list at least 5 real-world IoT applications.
Measurable	Describe IoT's 4-layer architecture with a labeled diagram.
Achievable	Identify 3–4 IoT communication protocols (e.g., MQTT, CoAP).
Relevant	Relate how AI is used to enhance IoT systems.
Time-bound	Complete a brainstorming activity and quiz within 1 hour.

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## Session Flow (1 Hour)

Time	Activity	Description
0–5 min	Warm-up Discussion	Prompt: “What IoT devices do you use in daily life?” Show image of smart devices.
5–15 min	Mini-Lecture: What is IoT?	Define IoT, explain how it connects devices. Show real-life examples: smart homes, wearables, agriculture, etc.
15–25 min	IoT Architecture	Explain the 4-layer model: 1. Perception 2. Network 3. Middleware 4. Application Draw or display diagram.

25–35 min	<b>IoT Protocols</b>	Introduce and briefly explain: – HTTP, MQTT, CoAP, WebSockets Show protocol stack diagram (see below).
35–40 min	<b>AI + IoT</b>	Discuss how AI enables predictive analysis, intelligent automation in IoT (e.g., smart irrigation, voice assistants).
40–50 min	<b>Class Activity: Smart Classroom</b>	Group brainstorm: Design an IoT-based smart classroom Tools: Chart paper or Google Doc 2 groups present ideas
50–55 min	<b>Quiz &amp; Recap</b>	5-question quiz (MCQ or verbal). Recap key points on board.
55–60 min	<b>Homework &amp; Closure</b>	Assign homework. Summarize session outcomes. Invite questions.

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## Class Activity Details

**Activity Name:** *Smart Classroom Ideation*

- **Task:** In teams, list features/devices for a smart classroom using IoT.
  - **Deliverable:** Sketch or point-wise list.
  - **Share:** 1–2 groups share ideas in class.
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## Homework / Extension Activities

### 1. Mini Research Task (Due in 2 days):

Write a 1-page report on:

**“How AI enhances IoT systems”**

Include one real-world example and the AI technique used (e.g., machine learning in predictive maintenance).

### 2. Extension (Optional):

Explore <https://wokwi.com>

Simulate an LED blinking using Arduino and WiFi – submit a screenshot.

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## Study Materials / References

### ♦ Recommended Books

#### 1. Internet of Things: A Hands-On Approach

- *Arshdeep Bahga & Vijay Madisetti*
- Chapter 1 (Intro), Chapter 4 (Protocols)

#### 2. Internet of Things: Architecture and Design Principles

- *Raj Kamal*
- Chapters 2, 3, 5

#### 3. Internet of Things: Principles and Paradigms

- *Rajkumar Buyya & Amir Vahid Dastjerdi*
- Chapter 1 (Overview), Chapter 8 (AI + IoT)

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### ♦ Online Resources

Resource	Link	Use
Cisco Networking Academy	<a href="https://www.netacad.com/">https://www.netacad.com/</a>	Self-paced IoT course
IBM Developer IoT Hub	<a href="https://developer.ibm.com/technologies/iot/">https://developer.ibm.com/technologies/iot/</a>	Hands-on projects
Arduino IoT Cloud	<a href="https://create.arduino.cc/iot/">https://create.arduino.cc/iot/</a>	Real-time IoT design
Wokwi IoT Simulator	<a href="https://wokwi.com">https://wokwi.com</a>	Online simulation without hardware
NPTEL YouTube Lectures	<a href="#">Watch Playlist</a>	Indian faculty, real-life relevance

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