**HINDUSTHAN INSTITUTE OF TECHNOLOGY**
**An Autonomous Institution**
**(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai,**
**Accredited with "A" Grade by NAAC)**
Valley Campus, Pollachi Main Road, Coimbatore 641 032

**Department of Computer Science and Engineering**

Course Pedagogical Activity Report-**Active Learning with Technology**

Department: Computer Science and Engineering

Course Title: Internet of Things

Course Code: 20CS533

Year: 2024–2025 (Odd Semester)

Semester: VII

## Pedagogical Approach 1: Project Based Learning

### 1. Instructional Session Details

Title of the Unit: Domain Specific Applications of IOT

Instructional Topic: Introduction to IoT & Its Applications

ICT Tool Utilized: IOT Kit

### 2. Pedagogical Execution Details

| Element | Description |
|---|---|
| Teaching Strategy | Hands on Training |
| Technology Platform | Arduino IDE |
| Student Involvement | Active participation through device setup, coding, and testing of IoT applications. |
| Instructor Role | Facilitator and guide who provides demonstrations, answers query, assists with troubleshooting. |
| Engagement Modality | Blended learning approach with in-person hands-on activities |

### 3. Learning Impact

- Improved **hands-on skills** in IoT hardware assembly and software programming
- Enhanced **team collaboration** and problem-solving in real-world IoT contexts
- Strengthened **practical understanding** of sensor integration, device control, and data processing

- Students **built and demonstrated working IoT prototypes** such as smart lighting, temperature monitoring, or home automation projects

## 4. CO–PO–PSO Alignment

| Course Outcome (CO) | Mapped PO/PSO | Attainment Level | Justification |
|---|---|---|---|
| **CO1** | PO1 | 3 | Demonstrates basic engineering knowledge and understanding of IoT systems and components through practical and theoretical exploration. |
| | PO2 | 3 | Analyzes and interprets real-world IoT problems to derive logical solutions. |
| | PO4 | 3 | Applies research-based methods to investigate system behavior and validate IoT designs through simulations and prototypes. |
| | PSO1 | 3 | Applies core knowledge of embedded systems and electronics to design and simulate IoT applications. |
| | PSO2 | 3 | Integrates interdisciplinary concepts from cloud, networking, and sensors in IoT-based mini projects. |
| **CO4** | PO1 | 3 | Applies fundamental principles of data acquisition, processing, and system integration within IoT-based environments. |
| | PO2 | 3 | Identifies appropriate tools and methods for analyzing and evaluating IoT-based data systems. |
| | PO4 | 3 | Conducts experiments using platforms like Tinkercad or Arduino and interprets outcomes effectively. |
| | PSO1 | 3 | Demonstrates domain-specific competence in configuring and testing IoT systems for real-world challenges. |
| | PSO2 | 3 | Combines cloud storage, sensor data, and analytics in designing IoT solutions relevant to energy, home automation, and environment. |
| **CO5** | PO1 | 3 | Understands technical principles behind system connectivity, communication protocols, and IoT architecture. |
| | PO2 | 3 | Uses analytical reasoning to optimize the performance of IoT systems and troubleshoot failures. |

| | | | |
|---|---|---|---|
| | PO4 | 3 | Investigates, models, and interprets performance of networked IoT devices using research techniques. |
| | PSO1 | 3 | Develops and simulates functional prototypes involving sensors, actuators, and controllers. |
| | PSO2 | 3 | Applies full-stack knowledge of IoT to create innovative and context-aware automation solutions. |

**5. Activity Description:**

Students were divided into small teams and assigned IoT-based mini projects using the provided IoT kits. They were required to:

- Identify a real-world application (e.g., smart home lighting, environmental monitoring)
- Design the circuit layout and choose appropriate sensors/actuators
- Program the controller using Arduino IDE
- Test and troubleshoot the system
- Present their solution to peers and instructors

**6. Interaction Pattern:**

**Student–Student:** Peer collaboration on circuit design, code development, and problem-solving

**Student–Instructor:** Continuous feedback, technical guidance, and troubleshooting support

**Student–Tool:** Interaction with IoT hardware, sensors, Arduino IDE, and supporting simulation tools

**Group–Group:** Inter-group presentations and feedback sessions on project effectiveness

**7. Pedagogical Evidence**

- Photos and videos of student-built IoT projects
- Code submissions (Arduino) for evaluation
- Peer and instructor assessment reports
- Observation logs maintained during hands-on sessions

- Feedback collected from students via Google Forms on the learning experience
- Rubric-based evaluation of functionality, innovation, teamwork, and documentation

**Photos:**

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