IoT with Machine Learning Internship Curriculum (3 Months + Mini Project)

Month 1: IoT & Programming Foundations

Week 1: Introduction to IoT

- What is Internet of Things (IoT)
- IoT Architecture
- Applications of IoT (Smart Home, Healthcare, Industry)
- Sensors & Actuators Overview

Week 2: Embedded Systems Basics

- Microcontrollers (Arduino / ESP32 / Raspberry Pi – Overview)
- Arduino IDE Setup
- Digital & Analog Sensors
- Interfacing Sensors

Week 3: Communication & Networking

- IoT Communication Protocols (HTTP, MQTT)
- Wi-Fi & Bluetooth Basics
- Cloud Platforms Overview
- Data Transmission from Devices

Week 4: Python Basics for IoT & ML

- Python Basics
- Data Types & Functions
- Reading Sensor Data
- Storing Data (CSV / Database)

Month 2: Machine Learning for IoT

Week 5: Data Handling & Visualization

- Data Collection from IoT Devices
- Data Cleaning

- Pandas & NumPy
- Data Visualization (Matplotlib)

Week 6: ML Fundamentals

- What is Machine Learning
- Supervised vs Unsupervised Learning
- Train-Test Split
- Model Evaluation Basics

Week 7: ML Algorithms for IoT

- Linear Regression
- Logistic Regression
- Decision Trees
- K-Means Clustering

Week 8: Real-Time IoT + ML Integration

- Predictive Analytics
- Anomaly Detection
- Real-time Data Processing
- ML Model Integration with IoT Data

Month 3: Cloud, Deployment & Mini Project

Week 9: Cloud & IoT Platforms

- IoT Cloud Platforms (AWS IoT / ThingSpeak / Firebase – Basics)
- Data Storage & Visualization
- API Integration

Week 10: Deployment & Tools

- Model Deployment Basics
- Edge vs Cloud ML
- Git & GitHub
- Debugging & Monitoring

Week 11–12: Mini Project

- Problem Statement Selection
- Sensor Data Collection
- ML Model Building
- Integration & Testing
- Final Presentation & Documentation

Mini Project Ideas

- Smart Home Automation with Prediction
- IoT-based Weather Monitoring System
- Smart Energy Meter using ML
- Predictive Maintenance System
- Smart Agriculture using IoT & ML

Internship Outcomes

- Strong IoT & ML Fundamentals
- Hands-on Sensor & ML Integration
- Real-time Project Experience
- GitHub Portfolio
- Internship Certificate & Career Guidance