

Python & IoT - 30 Days Roadmap

Week 1 – Python & IoT Fundamentals

- Day 1: Introduction to IoT — concepts, real-world applications, hardware & software overview.
- Day 2: Python basics for IoT — variables, loops, functions, modules.
- Day 3: GPIO basics — how Python interacts with hardware pins.
- Day 4: Setting up Raspberry Pi (or ESP32 with MicroPython) and running first script.
- Day 5: Using Python libraries for hardware control (RPi.GPIO, gpiozero).
- Day 6: Reading data from simple sensors (temperature, humidity).
- Day 7: Mini Project: LED control with Python (on/off, blink patterns).

Week 2 – Sensors, Actuators & Data Handling

- Day 8: Interfacing with multiple sensors (motion, light, gas).
- Day 9: Controlling actuators (motors, servos) with Python.
- Day 10: Data acquisition from IoT devices.
- Day 11: Storing IoT data in CSV, JSON, or SQLite database.
- Day 12: Real-time data visualization using matplotlib or Plotly.
- Day 13: Introduction to MQTT protocol for device communication.
- Day 14: Mini Project: Sensor data logger (logs temperature & humidity every minute).

Week 3 – Networking & Cloud Integration

- Day 15: IoT networking basics — IP addressing, Wi-Fi setup.
- Day 16: Sending IoT data to cloud platforms (ThingSpeak, AWS IoT, Blynk).
- Day 17: Receiving commands from the cloud to control devices.
- Day 18: Building a web dashboard using Flask for IoT data.
- Day 19: Controlling IoT devices from a web/mobile interface.
- Day 20: IoT security basics — encrypting data & securing APIs.
- Day 21: Mini Project: Remote home automation (light & fan control over the internet).

Week 4 – Advanced IoT Applications & Capstone

- Day 22: Edge computing — processing IoT data locally before sending to cloud.
- Day 23: Machine Learning on IoT devices (TensorFlow Lite).
- Day 24: Image processing with IoT cameras using OpenCV.
- Day 25: Voice control for IoT devices (Google Assistant, Alexa integration).
- Day 26: Energy-efficient IoT programming for battery-powered devices.
- Day 27: Strategies for scaling IoT projects (multiple devices, monitoring).
- Day 28: Capstone Planning — choose a project: Smart Home, Smart Farming, Industrial IoT.
- Day 29: Build & test the capstone project.
- Day 30: Deploy, document, and prepare project for portfolio.