

Advanced Internet of Things (IoT) Bootcamp for Beginners

Course Overview:

This course provides an in-depth exploration of the Internet of Things (IoT), combining theoretical learning with practical, hands-on projects. Participants will gain proficiency in using various IoT hardware and software and will be equipped to develop and implement IoT solutions in real-world scenarios. The course includes an internship component to provide real-world experience and enhance job readiness.

Course Objectives:

- Understand the fundamentals and architecture of IoT.
- Learn to interface and control various sensors and actuators using microcontrollers.
- Develop skills in programming and configuring IoT devices.
- Gain hands-on experience with IoT projects.
- Understand IoT communication protocols and cloud integration.
- Complete an internship to apply learned skills in practical environments

Course Outline:

Module 1: Introduction to Embedded Systems

- Basics of Embedded Systems
- Difference between Microcontrollers and Microprocessors
- Overview of Arduino Platform
- Discussion on Embedded System Applications

Module 2: Installation of Arduino IDE and Blink Example

- Installing and Setting Up Arduino IDE
- Writing and Uploading Your First Sketch

Module 3: Interfacing LED with Intensity Control

- Introduction to Pulse Width Modulation (PWM)
- Controlling LED Brightness

Module 4: Interfacing a Push Button and LED

- Digital Inputs and Outputs
- Debouncing Techniques

Module 5: Interfacing a 7-Segment Display

- Basics of 7-Segment Displays
- Displaying Numbers and Characters

Module 6: Interfacing a Potentiometer and a Joystick

- Reading Analog Inputs
- Mapping Values for Control

Module 7: Interfacing an LCD Display 16X2

- Basics of LCD Displays
- Displaying Text and Data

Module 8: Interfacing a DHT11 Sensor

- Introduction to Temperature and Humidity Sensors
- Reading and Displaying Data

Module 9: Interfacing an IR Sensor

- Basics of Infrared Sensors
- Object Detection

Module 10: Interfacing an LDR or BH1750 Sensor

- Using LDR and BH1750 Sensors

Module 11: Interfacing a Soil Moisture Sensor

- Basics of Soil Moisture Measurement
- Monitoring Soil Moisture Levels

Module 12: Interfacing an Ultrasonic Sensor

- Distance Measurement Using Ultrasonic Waves
- Calculating Distance

Module 13: Interfacing MPU6050 Sensor

- Introduction to Accelerometer and Gyroscope

- Reading and Using Sensor Data

Module 14: Interfacing a Servo Motor

- Basics of Servo Motors
- Controlling Position and Movement

Module 15: Controlling a Pump with a Relay

- Relay Basics and Applications
- Using Relays to Control High Voltage Devices

Module 16: Controlling a DC Motor with L298N Motor Driver

- DC Motor Control Basics
- Using L298N Motor Driver for Speed and Direction Control

Module 17: Introduction to IoT

- Overview of IoT
- IoT Architecture and Components

Module 18: Interfacing a Bluetooth Module (HC-05)

- Bluetooth Communication Basics
- Interfacing HC-05 with Arduino

Module 19: Creating Account in Blynk or ThinkSpeak Server

- Introduction to IoT Cloud Platforms
- Setting Up Blynk/ThinkSpeak Accounts

Module 20: Interfacing a WiFi Module ESP8266

- WiFi Communication Basics
- Interfacing and Programming ESP8266

Projects:

- **Project 1:** Building a Traffic Lights
- **Project 2:** Smart Street Light System
- **Project 3:** Bluetooth Controlled Car
- **Project 4:** Line Follower Robot
- **Project 5:** Self-Balancing Platform
- **Project 6:** Smart Dustbin

- **Project 7:** IoT-based Weather Station
- **Project 8:** Home Automation (Controlling Appliances with Smartphone)
- **Project 9:** Automatic Irrigation System
- **Project 10:** Obstacle Avoiding Robot

Assessments:

- Quizzes and Assignments
- Lab Work and Practical Sessions
- Project Evaluations
- Final Examination
- Internship Performance and Report

Resources:

- Course Materials and Slides
- Arduino Kits and Sensors
- Online Tools and IDEs
- Access to IoT Cloud Platforms
- Community Forums and Support

Duration:

- 4 weeks with 2-3 hours of lectures per week and 4-5 hours of project work per week.

Additional Features:

- Live Instructor Classes
- Doubt Sessions
- Project Hands-On
- Certification on Course Completion
- Recorded Sessions
- Evening Classes

For Registration/More Details: [https://www.nationin.com/traininginternship/-internet-of-things-\(iot\)-training-and-internship](https://www.nationin.com/traininginternship/-internet-of-things-(iot)-training-and-internship)