



INTERNET OF THINGS

**Course
Handout**





Name of the course:
Internet of Thing with Data Analytics

Details about the course:

Those who invest in learning IoT (Internet of Things) skills can help transform any business in any industry, from manufacturing to saving endangered species. The combination of increased global Internet access and a growing number of devices designed to connect is creating endless opportunities. Imagine 26 billion people, systems, and physical objects connecting and sharing data seamlessly over the internet by the year 2021. This isn't a what-if scenario, its real-life and its coming together all around us right now. Learn how the Internet of Things is changing the world and the skills needed to land a well-paying job. Take your first step now!

DURATION

The training will be of eight weeks (Can be discussed and modified)

- TechBairn will provide its own kits with additional cost or participants can purchase at own to work on.
 - Participants will work in individually with everyone get an opportunity to work hands-on.
 - Live Practical Sessions with Live Online Interaction with Instructor. And 24x7 Student support round the clock.
 - Late night timing slots also available for international students.
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Syllabus of the Course:-

1. Course Introduction or General introduction about IOT:

- Who are we?
- What is the course about?
- Peer Introduction, walkthrough, how to ask for suggestions, prerequisites about the course, course-overview, and finally tasks-overview.

1. Introduction to C Programming

- Define, distinguish and give examples of hardware/software, computer programs/algorithms.
- Explain the concept of a variable and declare.
- Initialize and modify variables of data type's int, double and char.
- Create and comment simple C-programs that may print text.
- Special characters and variables to the screen with controlled formatting.
- Create simple C-programs that utilize for-loops to repeat blocks of instructions.

2. Introduction to Electronics

- Basic of electronics
- Power Supply Circuit
- Schematics
- Branch of Electronics
- Embedded Systems
- Microcontroller and Microprocessor
- Current and Future Scope

Introduction to Arduino

- Understanding the Arduino platform
- Applications of Arduino
- Type of Arduino

• General Purpose I/O Interfacing

- Labs on Digital inputs using switches
- Labs on digital outputs

Pulse Width Modulation

- Understanding the basics of PWM
- Concept of pseudo analog voltage generation using PWM
- Lab – Controlling LED intensity using PWM
- Project – Breathing LED concept using- PWM

• ADC interfacing

- Basic Concepts
- Sensor input reading
- Lab – Reading potentiometer data
- Lab – Reading LDR data and controlling LED relay

• Serial Interfacing

- Basic Concepts
- Lab – information exchange from hardware to PC
- Project – Sensor Data Logging on PC



SPI Interface

- Basic concept
- Lab – NRF Interfacing
- Project – Wireless Data Acquisition

● **Wifi Interface**

- Basic Concepts
- Project – Wireless Sensor Data Logging

● **Internet of Things**

- Introduction to IoT
- Future scope of IoT
- How to start with IoT
- Technologies involve in IoT
- Projects on IoT

● **Node-Red**

- Fundamental of Cloud
- What is server
- How to design Nodes
- Data Logging

● **Project Reports**

- Each project must have an industry standard project report

Hands-on/Practical Exercises

Mini Projects:

Project	Outcomes	Platform
Color Circle	PWM Interface GPIOs	Arduino Uno NRF 24L01P ESP8266
Two Channel Serial Data Acquisition System	ADC Interface Serial Interface	Wireless Data Acquisition
Wireless Data Acquisition	NRF	Node Red Thing Speak
Designing an IBM Cloud Dashboard	Node Red Dash Board Interface	



Major Projects

- Wireless Data Acquisition (Using NRF 24L01P)
- Home Automation System using IBM Cloud IOT Services

COURSE OUTCOMES

- Participants will be introduced to Internet of Technology and its Application.
- The training includes hands-on labs resulting in exploration of concepts.
- Upon successful completion of course, participants will get a TechBairn completion certificate.

Certification Criteria:

- Peer to peer interaction.
- Discipline & behaviour.
- Weekly assignments need to submit the repositories of the above projects (result evaluated in 4 days)
- Need to complete and submit a final project in team of 2 for a discussed project idea from a list of ideas.
- Top 3 teams will be declared based on Code Quality and overall performance.

Marking scheme:



Activity	Marks
Peer to Peer interaction	10
Discipline & Behaviour	10
Weekly assignments	30
Final Project	50

Internship After Course Completion:

Eligibility: Anyone with a laptop (min i3, 4gb ram) & an eagerness to learn.

Course OutComes:

Contact Details:

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