1. **Chapter 1   Introduction to IoT** (20 hours)
2. **Chapter 2   Basic Circuit and Raspberry Pi Configuration** (28 hours)
3. **Chapter 3   Version Control with Git and GitHub** (14 hours)
4. **Chapter 4   Raspberry Pi with Python** (16 hours)
5. **Chapter 8**  .**IoT Platform & Data Visualization** (23 hours)

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| **Course Contents** | **Duration** |
| **Chapter 1. Introduction to IoT** | **20H (Total)** |
| * Unit 1. IoT Overview | 3H |
| * Unit 2. IoT Technology and Application | 4H |
| * Unit 3. Components and Features of IoT | 4H |
| * Unit 4. Types and Features of IoT Platform | 4H |
| * Unit 5. IoT and Network | 4H |
| * Quiz | 1H |
| **Chapter 2. Basic Circuit and Raspberry Pi Configuration** | **28H**  **(Total)** |
| * Unit 1. How to Run Raspberry Pi | 3H |
| * Unit 2. Understanding of Circuit | 6H |
| * Unit 3. Understanding of Sensor | 6H |
| * Unit 4. Basic Circuit, Components, Sensors & Actuators | 4H |
| * Unit 5. Mini Project using GPIO Zero | 8H |
| * Quiz | 1H |
| **Chapter 3. Version Control with Git and GitHub** | **14H (Total)** |
| * Unit 1. What is Version Control? | 1H |
| * Unit 2. Overview and Installation | 3H |
| * Unit 3. GitHub Overview and Terminologies | 3H |
| * Unit 4. How to Use GitHub | 3H |
| * Unit 5. Collaboration using GitHub | 3H |
| * Quiz | 1H |
| **Chapter 4. Raspberry Pi with Python** | **16H (Total)** |
| * Unit 1. CPU Usage Monitoring Project | 5H |
| * Unit 2. Controlling Sensor’s Span Project | 5H |
| * Unit 3. Temperature Data Visualization Project | 5H |
| * Quiz | 1H |
| **Chapter 8. IoT Platform & Data Visualization** | |
| * Unit 1.Using Platform | |
| * Unit 2.IoT Open Platform Mobius Installation & Operation | |
| * Unit 3.OpenHAB | |
| * Unit 4.Data Visualization | |
| * Quiz | |

# **Course Details**

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| **Chapter** | **Details** | **Duration** |
| **1** | **Chapter 1. Introduction to IoT** | **20H (Total)** |
| [Objective] Understand the definition of IoT and market trend, especially about IoT components and features of IoT platform |
| Unit 1. IoT Overview   * Definition of IoT and background of IoT’s emergence | 3H |
| Unit 2. IoT Technology and Application   * IoT technology and application in different industries | 4H |
| Unit 3. Components and Features of IoT   * Components of IoT and its features | 4H |
| Unit 4. Types and Features of IoT Platform   * Types of IoT platform and its features | 4H |
| Unit 5. IoT and Network   * Network environment for IoT | 4H |
| Quiz | 1H |
| **2** | **Chapter 2. Basic Circuit and Raspberry Pi Configuration** | **28H (Total)** |
| [Objective] Understand circuits and IoT devices and software; and Learn how to connect and configure a development environment to run Raspberry Pi |
| Unit 1. How to Run Raspberry Pi   * Overview of Raspberry Pi * Getting Started with Raspberry Pi * Practice Environment Configuration | 3H |
| Unit 2. Understanding of Circuit   * Digital input and electric Circuits * LED and sensor: ultrasonic Sensor, 7-segment (4 Digit LED); and temperature-humidity sensor * Primary control programming * UART Communication * Making Process | 6H |
| Unit 3. Understanding of Sensor   * Definition and features of sensor * Classification and application of sensor | 6H |
| Unit 4. Basic Circuit, Components, Sensors & Actuators   * Basic electronics * Types of electronic parts * Interpretation of circuit diagram | 4H |
| Unit 5. Mini Project using GPIO Zero   * GPIO Zero * Control LEDs, sensors and buttons with GPIO Zero | 8H |
| Quiz | 1H |
| **3** | **Chapter 3. Version Control with Git and GitHub** | **14H (Total)** |
| [Objective] Understand version control of Git and GitHub and user interface and functions of GitHub; Distribute software with GitHub; and Perform a collaborative mini-project |
| Unit 1. What is Version Control?   * Types and benefits of version control | 1H |
| Unit 2. Overview and Installation   * Characteristics of Git * Installation of Git and GitHub | 3H |
| Unit 3. GitHub Overview and Terminologies   * Overview and Terminologies of GitHub | 3H |
| Unit 4. How to Use GitHub   * Use GitHub when working along and through GUI environment | 3H |
| Unit 5. Collaboration using GitHub   * Collaborative project in Python programming using GitHub | 3H |
| Quiz | 1H |
| **4** | **Chapter 4. Raspberry Pi with Python** | **16H (Total)** |
| [Objective] Practice Python with a toy project using Raspberry Pi; and Learn how to develop IoT devices using Python |
| Unit 1. CPU Usage Monitoring Project   * Control LED * Monitoring the Raspberry Pi board * Create text files * Carry out a toy project | 5H |
| Unit 2. Controlling Sensor’s Span Project   * Use potentiometer and ultrasonic sensor * Create a toy project | 5H |
| Unit 3. Temperature Data Visualization Project   * Data visualization * Create a toy project | 5H |
| Quiz | 1H |
| 8 | Unit 1. Using Platform   * oneM2M Platform Architecture   IoT Open Platform: OCEAN | 8H |
| Unit 2. IoT Open Platform Mobius Installation & Operation   * Mobius Platform Overview   Establishing a service environment | 6H |
| Unit 3. OpenHAB   * OpenHAB Overview * OpenHAB Installation and Demonstration   Configuring OpenHAB for MQTT Binding | 4H |
| Unit 4. Data Visualization   * Visualization concept & importance   Open source visualization tools : Grafana | 4H |
| Quiz | 1H |