Hewlett Packard Enterprise

Course Datasheet

Internet of Things (IoT)

Education Services course product number – HPE-IoT-v1.0
Course length – 72 Hrs.
Delivery mode – Instructor Led Training (ILT)
Virtual Instructor Led Training (vILT)

Internet of Things (IoT) is the internetworking of Connected Devices, Smart Devices, Sensors, Motors, Software system and other things embedded with electronics and linking them each other on a cloud so as to get updates remotely from almost anywhere anytime. Some of the IoT based systems includes Smart Home Automation System, Smart Waste Management System, Smart Lighting, Smart Transportation System, Remote Health Monitoring, and likewise many others. The area of IoT is growing rapidly and bringing in new job roles and related career opportunities to those who are proficient in IoT technology, management, deployment, and security etc. and therefore it is becoming increasingly important to understand what it is, how it works, and how to harness its ability to improve business.

Course Objective

The course will help learner understand the fundamentals of IoT, its design, development and security related challenges. The 72 hrs course will also help a learner to understand the concepts like IoT Architecture, Communication Protocols, Software and Hardware Platforms, Sensors and Actuators, Programming Concepts using C language, and to understand the working of Arduino and Raspberry Pi platform.

Prerequisite

No Perquisites are essential to undergo this course however it is recommended to have basic understanding on concepts like networking, sensing, programming and business concepts.

Course Modules

Chapter 01 - Introduction to Interest of Things (IoT)

- What is IoT?
- History of IoT
- Current technological trends and future prospects
- IoT Devices vs Computer Devices

- Real World IoT Applications in different industry verticals
    - Smart Building
    - Home Automation
    - Smart City
    - RFID
- How large is the IoT Market in different domains?
- Societal Benefits of IoT
- Design, Development Security and other Challenges in IoT
- Characteristics of IoT
- Its relation with embedded system
- Difference between IoT and M2M

Chapter 02 - IoT Architecture

- Elements of IoT Architecture
- Sensors & Actuators
- IoT Device Architecture
- IoT Network Architecture
- Node, Gateway, and Cloud
- Analog Digital conversion
- Analytics and Visualization

Chapter 03 - IoT Communication Protocols and Networking

- Importance of Networking
- Networking Components
- Wireless Communication Protocols
- Transport Layer Protocols
- IPv4 and IPv6
- Application Communication Protocols

Chapter 04 - Software and Hardware Platforms

- Integrated Circuits
- Microcontroller Components and its properties
- The 8051 Architecture and Advanced Architecture
- Programming Languages
    - C, C++, and Python
- Hardware Platforms
    - Arduino
    - Raspberry Pi
    - ESP8266
    - Comparative Analysis
    - Criteria for selecting Hardware platform
- Communication Interfaces
- Operating Systems
- Cloud Platform for IoT

Chapter 05 - C Programming Concepts

- Setting up C Environment
- Hello World
- Basic C Operators

- Variables and Data Types
- Conditionals
- Loops
- Functions
- Arrays
- Strings
- Pointers

Chapter 06 - Arduino and Raspberry Pi Platform Overview

- Arduino Platform
    - Arduino Basics
    - Arduino Board Layout and Architecture
    - Arduino Schematics
    - How to Program Arduino with Arduino IDE
    - Arduino Shields and Libraries
    - Arduino Web Editor
    - Interfacing Sensors with Arduino
    - Make your Arduino respond to Sensors and Actuators
    - Reading from Sensors and Writing to Sensors
- Raspberry Pi Platform
    - Working with Raspberry Pi 3 Model
    - Understanding Board Architecture and Processor
    - Installing OS and Designing Systems using Raspberry Pi
    - Interfacing Sensors and Actuators with Raspberry Pi
    - Overclocking
    - Programming Raspberry with Arduino