TECHNOCATION FREELANCING TRAINING INSTITUTE & SOFTWARE HOUSE

Professional Raspberry PI Course Outline

Module 1: Introduction to Raspberry Pi

- Overview of Raspberry Pi Models and Features
- Setting Up the Raspberry Pi (OS Installation, First Boot)
- Basic Configuration and Terminal Commands
- Connecting Peripherals (Keyboard, Mouse, Monitor)

Module 2: Linux and Raspberry Pi OS Essentials

- Understanding the Linux File System
- Basic Linux Commands & Shell Scripting
- Networking and Remote Access (SSH, VNC)
- Managing Software with APT (Installing/Updating Packages)

Module 3: Programming with Python on Raspberry Pi

- Introduction to Python Programming
- GPIO (General Purpose Input/Output) Basics
- Controlling LEDs and Buttons
- Interfacing with Sensors (Temperature, Motion)

Module 4: Raspberry Pi as a Media Center and Server

- Setting Up a Media Center with Kodi
- Creating a Web Server (Apache, Nginx, Flask)
- Hosting a Personal Cloud (Nextcloud)
- Setting Up a File Server (Samba, FTP)

Module 5: IoT and Home Automation with Raspberry Pi

- Connecting to IoT Devices
- Home Automation with MQTT and Node-RED
- Using Raspberry Pi with Smart Assistants (Alexa, Google Home)
- Building a Smart Security System

Module 6: Hardware Interfacing and Robotics

- Working with Motors and Servos
- Building a Simple Robot Car
- Using Camera Module for Computer Vision
- Integrating AI with Raspberry Pi

Module 7: Raspberry Pi Projects and Real-World Applications

- Weather Monitoring System
- Smart Mirror Project
- Home Automation Dashboard
- Custom Raspberry Pi Project

Module 8: Advanced Topics and Optimization

- Overclocking and Performance Tuning
- Power Management and Battery Operation
- Security and Hardening Raspberry Pi
- Creating a Custom Raspberry Pi OS Image

Final Module: Capstone Project & Certification

- Planning and Building a Final Raspberry Pi Project
- Presentation and Demonstration
- Course Completion Certification