Embedded Technosolutions
Venture of IIT Bombay & VJTI Alumni

3 Times IIT Bombay Robo Competition Winner

Industrial Certified
Embedded & Robotics Developer

All India Council For Technical Skill Development (AICTSD)
In Association with
IITTians Embedded Technosolution
Embedded Raspberry Pi IOT

Module 1: Raspberry Pi Set up & Configurations

- Program Raspberry Pi: a credit-card sized computer
- Python programming for Raspberry Pi
- Interacting and configuring the RPi OS
- ARM 11 architecture
- Porting of Linux Kernel and booting RPi

Module 2: Linux Command for Application Execution

- Linux Programming Basics
Module 3: Raspberry Pi GPIOs

- Programming the GPIO and interfacing peripherals with Raspberry Pi

Module 4: PWM Generation

- Generating PWM signals through the Pi for various applications

Module 5: UART Protocol & Interfacing

- Programming and work with UART protocol, example Bluetooth

Module 6: I2C Protocol Interfacing & Applications

- Work with I2C protocol

Module 7: Camera Interfacing & Applications Designing

- Camera Libraries & Driver Installations
- Camera based applications designing

Module 8: Raspberry Pi Webserver

- Remote login methods: HyperTerminal, Ethernet
- LED operation using IoT
- Embedded Webserver
Module 9: Computer App Designing

- Developing GUI with TKinter

Embedded Arduino

Chapter 1

- Introduction to Embedded System with Arduino
- Scope of Arduino in Embedded Systems

Chapter 2

- Introduction to Arduino series
- Hardware architecture of Arduino controller Series
- Controller I/O ports
- Memories of controller
- Concept of Serial communication, Interrupt etc.

Chapter 3

- Introduction of Embedded Arduino Software
Introduction of Embedded C Programming and programming concepts for Arduino

Introduction of program flashing and error correction

Chapter 4

I/O interfacing concept

Led Blinking logic and delay generation routine

Chapter 5

Character LCD 16x2 interfacing logic and concept

Introduction of LCD command and data signals

LCD based programming

Practical project based on character LCD

Chapter 6

Matrix keypad interfacing logic and concept

Introduction of key pad interfacing using polling method

Matrix keypad programming
Chapter 7

- Introduction to serial communication
- Serial communication concept
- Introduction of serial communication firmware and registers
- Serial communication programming
- Practical application based on Serial communication

Chapter 8

- Introduction of interrupts in controller
- Interrupt logic and concept
- Interrupt routines / programming
- Key interfacing using interrupt
- Practical application based on interrupt
Chapter 9

- Introduction of ADC
- ADC interfacing
- ADC programming

Chapter 10

- Introduction of DTMF mobile technology
- DTMF technology interfacing in real application
- DTMF programming
- Practical project design based on DTMF technology with Arduino

Chapter 11

- Introduction to RF & RFID communication
- RFID technology interfacing in real application
- RFID module programming
- Practical project design based on RFID technology with Arduino
Chapter 12

- Introduction of I2C Protocol
- I2C protocol interfacing in real application
- I2C module programming
- Practical project design based on I2C protocol with Arduino

Chapter 13

- Introduction of Bluetooth Communication
- Bluetooth technology interfacing in real application
- Bluetooth module programming
- Practical project design based on Bluetooth technology

Chapter 14

Practical designing of a project based on above technology with Arduino
**Live Projects:**

**Raspberry Pi IOT Based**

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<td>Camera based Surveillance System</td>
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**Live Projects:**

**Embedded Arduino Based**

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