SmartBrains Engineers & Technologist Pvt Ltd

EMBEDDED COURSE CONTENT

Course 1: C Language & Embedded C

Why C in Embedded
ANSI standard
Function of C
Conditional Statements
Loops
Function
Arrays
Strings
Storage Classes
Structure & Unions
Enumerated Data Types
Bit Operation
Pointer
Dynamic Memory Allocation
File handling Concept
Raw Data Handling
Low Level Programming
Command Line Arrangements
Compiler in Practical
Data Structures
Sorting & Searching Techniques
Concepts & Real Time Exposure

Course 2: Microcontroller 8051/AVR/PIC/ARDUINO/ RASPBERRY-PI

Introduction
Overview of Architecture of 8051/AVR/PIC
Low-Level Programming Concept
Middle Level Programming

Concepts

Cross Compiler
Embedded C/C++ Programming
Embedded C/C++ Debugging
Memory Models
Library Reference
#Pragma Directive

ON Chip Peripherals

Ports: I/P & O/P
Timer & Counter
Interrupts, ADC, PWM

External Interfaces

LEDS, LCD, SWITCHES
Seven Segment & Multiplexing 7-segment display
Keypad Matrix
LED Matrix
AC/DC relays
Motor: DC Motor/ Stepper Motor/ Servo Motor
Wireless RF Modules
Zig Bee (Programming + Communication)

PROTOCOLS

SPI, I2C, UART, CAN

Course 3: ROBOTICS ENGINEER

Robotics Introduction
Chip Level & Component Level Electronics
Various Motor for Robot Development
Power Supply Designing
Robotic Sensor Designing & Interfacing
Robotic Motor Controller Circuit
Embedded C Programming
I/O Functions
PWM
ADC
Inter Robot Communication
Practical Electronics & Sensor Development
Practical working with Electronic Components

Resistor, Capacitor, Diodes, Transistor, Relay
Designing of Logic gate & Power Supply
Development of Sensor like Light, Surface etc

Course 4: Object Oriented Programming with C++

Overview
Characteristics
Function Overloading
Scope Resolution Operator
Classes in C++
Access Specifiers
Constructor, Destructor
Static Members, Function
Friend Classes, Friend functions
Operator Overloading
Data Conversion
Inheritance, Polymorphism
Exception Handing, Templates
I/P & O/P Streams

Mini Project For C & C++

Development Tools & Enviroment
Make Utility & multifile Programming
Industrial Coding Standards
Object/ Executable file format
Debugging large Programs

Course 5: ARM 7 TDMI-IPC2129 NC

Introduction to ARM Family
Block Diagram & System Architecture
Memory addressing & system control block
PIN connect block
GPID Programming
Timer Programming
A/D Converter
UART Programming
I2C & SPI Protocol
PIC
VIC (Vector Interrupt Controller)
CAN Conceptualization
I2C Enabled EEPROM Conceptualization

Course 6: Linux & Device Driver Programming

Linux Architecture
Kernel Description
Terminal Commands
File Management System
Process Management System
VI Editor
GCC Complier
Shell Scripting
Use of make File
Compile & Debugging
Char Driver Conceptualization

Course 7: IOT on Raspberry Pi

Introduction to the Internal of Things
Introduction to Raspberry Pi
Tools: Win 32 image write & SD Formatter
Wading Raspbrion OS image on SD Card
Demo Programming using C
Backing up Updating SD card & OS Image
Intalling Wiring Pi Package
Controlling the Raspberry Pi GPIO by Command

Networking with Pi

Client-Server Programing for Automating Device/Sniffing Device state

IOT-Cloud Installing

Installing & configuring PubNub SDK for C Language
Creating credentials with PubNub Cloud Server
End to End IOT Programming demonstrations

Sensors

Gyro & Accelerometer, Ultrasonic sensors, RFID, GPS, PIR Sensor, Temperature Sensor
Touch Pad, Gas Sensor, DTMF, RTC, Finger Print Sensor, RS 232, Alcohol Sensor, Humidity Sensor, Sound Sensor, Surface Sensor, Flex Sensor, Buzzer, Relay

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