

## EMBEDDED SYSTEMS COURSE DETAILS

**Course Name:** EMBEDDED SYSTEMS

**Course Duration:** 25 to 30 Hours

**Course Recourse:** Materials + Real time scenarios for practicing

**Course Content:** Given below

### **1) Fundamentals of C**

**- - - - - 10hrs**

#### **Introduction**

- a. Keyword & identifier
- b. Data types
- c. Variables & constants
- d. Input & Output
- e. C operators
- f. Basic program examples

#### **Flow control**

- a. if, else
- b. for loop
- c. while, do while loop
- d. break & continue
- e. switch case
- f. goto

#### **Functions**

- a. C programming functions
- b. C user defined functions
- c. C function types
- d. Recursive Functions
- e. C storage class

#### **Arrays**

- a. Defining, initializing and usage of arrays
- b. Multi-Dimensional Arrays
- c. Arrays & function

- d. Strings
- e. String functions

### **Pointers**

- a. C programming pointers
- b. C pointers & arrays
- c. C pointer & functions
- d. C memory allocation

### **Structures & Unions**

- a. C structure
- b. Structure & pointers
- c. C structure & function
- d. C programming union

### **Files**

Files input output

### **Additional topics**

- a. Memory allocation
- b. Enumeration
- c. Preprocessors
- d. C library functions
- e. Bit Operations
  - Masking, Setting, Clearing and Testing of Bit / Bits
- f. Volatile
- g. Structure alignment
- h. Typedef, #define
- i. Pragma directive
- j. Program memory

## **2) Understanding Embedded Systems**

----- **3hrs**

- a. Overview of Processors & Microcontrollers
- b. Memory (RAM, ROM, EPROM, EEPROM, FLASH)
- c. I/O Interfaces
- d. Serial & parallel communications

UART, I2C, SPI communication

- e. Cross Compilers
- f. source code to executable file
- g. Host & Target Development environment
- h. Downloading Techniques

### **3) 8051 Microcontroller**

- a. Architecture
- b. Pin description
- c. Input output ports
- d. interrupts

### **4) ARM Processors**

- a. Architecture
- b. Pin description
- c. Input output ports
- d. Lpc2148 processor features

### **5) Microcontroller Interfacings**

- - 10hrs

- a. LEDs
- c. Relay
- d. LCD
- e. Graphical LCD
- f. ADC
- g. Temperature Sensor
- h. Humidity Sensor
- i. DC Motor
- j. Stepper Motor
- k. IR Sensor
- l. Ultrasonic Sensor
- m. RF Modules
- o. UART, I2C & SPI communication ex
- p. Timers
- q. DTMF
- r. GSM
- s. GPS

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## **6) Students Explore Technical Project Hands On**

**----- 5 hrs**

### **Notes:**

1. After completion of 75% of course, student will go through Live Project Training, Interview Preparation.
2. Any hardware module will not be handed over to the students at the end of the course.