



PIC MICROCONTROLLER- SYLLABUS

Duration-45 days

Level-1: Basic Electronics

Definition of Electronic -Components Used in an Embedded System -Resistor & Types & Colour Coding -Capacitor & Types ,Diodes (1N4007, 1N5408) & Types -Transistor (BC547, SL100, TIP122) & Types -Integrated Circuits-Switching Circuits -Regulator IC's - Specified IC's (741,555, Uln2003, MCT2E)-Relay & functional diagram-RF-Transceiver.

Level-2: Fundamental Concept of C

C-Data types-Variables-Constants-Tokens-Operators-Priority of Operators- Conditional Statements- if statement, if else, if else ladder, Nested Ifs-Loops- for – while-do while-Nested loops-break-continue –goto-Case control and switch Vs if else ladder.

Level-3: Functions

Functions without return type-with return type- no arguments- passing single argument-multiple arguments-Miscellaneous issues –advanced features-call by value-call by reference-pointers- recursion-Memory functions.

Level-4: Arrays

Declaration and initialization-Arrays in functions-Array of pointers-passing an array element or an entire array to function- Bounds checking-Practical problems with bounds checking -introduction of 2D-arrays- Strings-Declaration-Initialization-Pointers and strings-string library functions.



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Reflecting Ideas..

Level-5: Advanced C

Structures-Declaration-Memory allocation-Structures with pointers-Union-difference between structure and union-Storage Classes-auto, static, register and extern[scope, lifetime, memory problems]-Global Vs Extern-extern keyword- Type Casting -Pre-processor-Macro Expansions-Pre-processor Directives.

Level-6: Foundation of Embedded System

Definition of Embedded System -Characteristics-Applications-Examples Language used in Embedded System -Embedded Programming-Embedded Programming using C-Difference between C & Embedded C-Build Process Components -Assembler & Compiler - Microcontroller's Architecture-Diversify microcontrollers-Hitech Cross Compiler.

Level-7: Overview of PIC Microcontrollers

Introduction to PIC micro controllers -Advantage of PIC micro controllers - Types and products of PIC.

Level-8: LCD, LED and 7 Segment Interfacing

Different peripheral device -Difference types of display units -7 Segments & its types -Principle of Operation-Common Anode mode-Common Cathode mode -16x2 LCD - Applications-Hardware interfaces-Interfacing Circuits for LCD & LED -Pin diagram of 16x2-working mechanism LCD using Arrays & Pointers.



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Reflecting Ideas..

Level-9: Analog to digital conversion

Working Principle of ADC- Application of ADC- ADC Resolution- Programming for ADC application-Temperature sensor interfacing with controller.

Level-10: Interrupts

Definition for Interrupt -Interrupt types -Handling interrupts -Polling sequences-Interrupt sequences-External interrupts-Internal interrupts-Programming for interrupt based applications-Problems at interrupts-Debugging ISRs-Interrupt Latency.

Level-11: UART Implementation

Serial Communication -Hardware Description-Logical Level Converter-MAX 232 -design-Serial Port-Programming for serial communication-Implementation with Real time application.

Level-12: I2C Protocols

I2C Protocol – Programming for I2C Protocol-Real time application using RTC- Advantages & Disadvantages of I2C Protocols.

Level-14: Application of Motors



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Reflecting Ideas..

Motors used for Robotics controls -Stepper Motor & Stepper driver circuit -
Stepper motor Bidirectional controlling of DC motor -Method to change polarity-Sample
programs -Different sensors-Applications.

Level-15: Encoders/Decoders

Introduction of various Encoders & Decoders -Examples HT12E/HT12D
Interfacing circuits-Real time implementation using encoder/decoder Programming -Examples
-Communication between two systems using RF module -Wireless data transfer using HT640
Encoder-Wireless data transfer using HT648 Decoder .