CETPA INFOTECH PVT. LTD.
CURRICULUM AVR MICROCONTOLLER

❖ **INTRODUCTION TO EMBEDDED SYSTEM**
- History & need of Embedded System
- Basic components of Embedded System
- Hardware Classification of Embedded System
- Programming Language Classification of Embedded System
- Advantage & Disadvantage of Low level & High level programming language of Embedded System

❖ **CLASSIFICATION OF MICROPROCESSOR & MICROCONTROLLER**
- Difference between Microprocessor & Microcontroller
- Classification based on architecture
- Classification based on Instruction Set
- Type of Microcontroller
- Memory Classification

❖ **BRIEF INTRODUCTION TO COMPUTER ARCHITECTURE**
- Classification of Von-Neumann and Hardware Architecture
- Difference between RISC and CISC
- Memory Classification (Primary & Secondary)

- User Defined Data type (structure)
- Array
- Pointers

● **Operators**
- Arithmetical Operator
- Logical Operator
- Bitwise Operators

● **Control Statement and Loops**
- If
- Switch
- For
- While
- Do While

● Introduction to Preprocessor Directives
● Assembly within C (Inline Assembly)

❖ **BASIC ELECTRONICS**

- Resistor
- Capacitor
- Diode
- Transistor

❖ **TYPES OF MOTORS**
- AC motor
- DC motor
- Stepper motor
- Servo motor
- DC geared motor

❖ **SWITCH & KEYPAD INTERFACING**
- Introduction to Switches & Keyboard Matrix
- Interfacing Circuit of Switches & Keyboard Matrix
- Programming of Keyboard Matrix & Switches
- Controlling of LED's by using Switches
- Key board Matrix & LCD Interfacing Program

❖ **TIMER**
- Timer0/Timer1/Timer2 Programming
- PWM using Timers

❖ **INTERRUPT**
- Timer Interrupts Programming
- External Hardware Interrupts Programming
- Interrupt Priority

❖ **RS232 INTERFACING**
- Interfacing with PC using UART/RS232
- Interfacing with PC using UART/RS232 with Interrupts

❖ **ADC INTERFACING**
- To display digital data on LED
- To display digital data on LCD

- ❖ **COMPUTER LANGUAGES**
  - Low Level Languages
  - Middle Level Language
  - High Level Language
  - Interaction of language with Compilers

- ❖ **EMBEDDED DEVELOPMENT TOOLS**
  - Assembler
  - Interpreter
  - Compiler
  - Simulator
  - Emulator
  - Debugger

- ❖ **INTRODUCTION OF EMBEDDED C**
  - Why C
  - Benefits of C over Assembly
  - Constants, Variables & Data Types
    - ➢ Keywords & Identifiers
    - ➢ Data type & its memory representation

- ❖ **MOTOR CONTROLLING CIRCUITS IC'S**
  - LM358(dual op- amp)
  - LM35(Temperature sensor)
  - L293D(dual H-bridge IC)
  - 805(Voltage regulator)

- ❖ **PIN DESCRIPTION & ARCHITECTURE OF AVR MICROCONTROLLER**

MEMORY ARCHITECTURE OF ATMEGA16

LED INTERFACING
  - Pattern generation using led panel

LCD INTERFACING
  - To move data on LCD in 8-bit
  - To move data on LCD in 4-bit
  - To display data on both rows in 4 and 8-bit Mode
  - Scrolling message display on LCD in 4 and 8 bits Mode.

- ❖ **SENSOR INTERFACING**
  - Introduction to Sensing Devices
  - IR Sensor Interfacing
  - Temperature Sensor Interfacing

- ❖ **I2C PROTOCOL**
  - Features
  - Implementation
  - DS1307 RTC Interfacing using I2C protocol

- ❖ **SPI PROTOCOL**
  - Features
  - Implementation
  - Serial Communication with PC in Master & Slave Mode using SPI Protocol.

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