

CETPA INFOTECH PVT. LTD.

CURRICULUM OF ROBOTICS

DURATION: 4 WEEKS

❖ INTRODUCTION TO ROBOTICS

- Present and future scope of robotics
- Types of robots
- Application of robotics

❖ BASIC ELECTRONICS

- Resistors
- Capacitors
- Diodes
- Transistor

❖ TYPES OF MOTORS

- Introduction to Motors
- AC motor
- DC motor
- Stepper motor
- Servo motor
- DC geared motor

❖ TYPES OF SENSORS

- Introduction to Sensing Devices
- IR sensor
- Light searching sensor
- Temperature sensor
- Touch sensor
- Motion sensor

❖ MOTOR CONTROLLING CIRCUITS

- Motor controlling using driver ICs IC's
- LM358(dual op- amp)
- LM35(Temperature sensor)
- L293D(dual H-bridge IC)
- 7805(Voltage regulator)

- Type of Microcontroller
- Memory Classification

❖ PIN DESCRIPTION & ARCHITECTURE OF AVR MICROCONTROLLER

❖ MEMORY ARCHITECTURE OF ATMEGA16

❖ BRIEF INTRODUCTION TO COMPUTER ARCHITECTURE

- Classification of Von-Neumann and Harvard Architecture
- Difference between RISC and CISC
- Memory Classification (Primary & Secondary)

❖ 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

❖ LED INTERFACING

❖ SEVEN SEGMENT INTERFACING

- Non-Multiplex
- Multiplex

❖ 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.

❖ 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

❖ 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

❖ INTRODUCTION OF EMBEDDED C

- Why C
- Benefits of C over Assembly
- Constants, Variables & Data Types
 - Keywords & Identifiers
 - Data type & its memory representation
 - 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)**

❖ 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

❖ SENSOR INTERFACING

- IR Sensor Interfacing
- Temperature Sensor Interfacing

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OTHER COMMUNICATION PROTOCOLS

- I2C protocol
- SPI Protocol

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