

Atmega8/atmega16/atmega32 Microcontroller

Course Name: AVR & ROBOTICS

Certification: By UVSoftsTechnologies Pvt. Ltd.

Introduction:-

- ✚ Introduction of Embedded System & robotics
- ✚ Evolution in Microcontroller technology
- ✚ Past, Present & Future 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
- ✚ AVR Series Micro-Controllers & atmega8/16/32 Drivers & Software Installation

Microcontroller AVR

- ✚ Microcontroller AVR Architecture
- ✚ Difference between Microprocessor & Microcontroller
- ✚ Classification based on architecture ,
- ✚ Classification based on Instruction Set
- ✚ Type of Microcontrollers
- ✚ Registers & memory
- ✚ Interrupts and Timers

INTRODUCTION OF EMBEDDED C

- ✚ Introduction to Embedded C
- ✚ Why C Benefits of C over Assembly
- ✚ Different between C & Embedded C
- ✚ Data Type of Embedded C
- ✚ Operators of Embedded C Statements & Loops of Embedded C

Constants, Variables & Data Types

- + Keywords & Identifiers
- + Data type & its memory representation
- + User Define data types (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)

IO Device Interface and Practical

Led

- + What is led & it's working
- + Interfacing of led with microcontroller
- + Programming of Led
- + Practices Of Led Programming

DC Motor

- + Introduction of DC Motor
- + What is DC gear Motor & it's working
- + Interfacing of motor with microcontroller
- + Control of motor with L293D IC
- + Programming Of Motor
- + Practices Of Motor Programming

Seven Segment

- ✦ What is Segment & it's working
- ✦ Types of segments
- ✦ Difference between Common Anode & common cathode
- ✦ Interfacing of segment with microcontroller
- ✦ Programming Of Seven Segments

Led Matrix

- ✦ What is LED MATRIX & it's working
- ✦ Types of MATRIX
- ✦ Interfacing of MATRIX with microcontroller
- ✦ Programming Of LED Matrix

Practices on Led Matrix

- ✦ Display a character
- ✦ Display name on it
- ✦ Scrolling of name

LCD

- ✦ What is LCD & it's working
- ✦ Types of LCD
- ✦ Register of LCD
- ✦ Initialization of LCD Functions
- ✦ Command of LCD Functions
- ✦ Data of LCD Functions
- ✦ Interfacing of LCD with microcontroller
- ✦ Programming of Lcd In both 4 bit & 8bit mode
- ✦ Practices on Above all

Sensor

- ✦ What is sensor & it's working
- ✦ Types of sensors
- ✦ Difference between analog & digital sensor
- ✦ Interfacing of sensor with microcontroller
- ✦ Programming Of Sensor

DTMF

- ✚ What is DTMF & it's working
- ✚ IC 9170B
- ✚ Interfacing of DTMF with microcontroller
- ✚ Programming OF DTMF

RELAY

- ✚ What is RELAY & it's working
- ✚ ULN2003A
- ✚ Interfacing of RELAY with microcontroller
- ✚ Programming OF RELAY

UART

- ✚ Serial vs Parallel Communication
- ✚ What is UART & it's working
- ✚ Register of UART
- ✚ Initialization Of UART
- ✚ Transmission from UART
- ✚ Receive from UART
- ✚ Interfacing of UART with microcontroller
- ✚ TESTING OF UART

PROJECT BY STUDENTS

- ✚ **Traffic Light Controlled System PROJECT**
- ✚ **LCD Based notification Board**
- ✚ **Keyboard Based LCD Display board**
- ✚ **Autonomous Object avoidance Robot**
- ✚ **Autonomous Object Follower Robot**
- ✚ **Basic Line Follower Robot (using LM324)**
- ✚ **Autonomous Line follower Robot**
- ✚ **Autonomous edge avoider Robot**

NOTE:

1. **Software tools** – Development Board and Programming AVR using AVR studio4 & Writing program using the AVR IDE & AVR Dude software to burn the program.
2. All faculties' members are from UVSOFTS TECHNOLOGIES PVT LTD. They are enriched in their industrial experience.

SMART BENEFITS:-

- Multi time boost in Confidence level and understanding of EMBEDDED world.
- A certificate will be awarded to each student. This will be recognized as a UVSOFTS certificate.
- You will be able to do your minor and major projects of academic value on your own
- This will be a gateway for Embedded Technology
- A fast emerging technology for Electronics professionals

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