

ROBOTICS

EMBEDDED SYSTEM

- Brief idea of Embedded Systems & Industrial applications
- Application/Area wise need of Embedded
- Hardware classification for Embedded

BRAIN OF EMBEDDED APPLIANCES

- Brief idea of Micro-controller/processor
- Why Microcontroller?
- Architecture of Microcontroller
- System architecture – RISC, CISC, Harvard, Von-Neumann
- Architecture of Microcontroller

'C' LANGUAGE

- **Introduction classes**
 - Basic syntax & programming structure
 - Data types, variables & operator
 - if-else & switch selection statement
- **Conditional statements or looping**
 - While, do-while
 - For, nested-for statements
 - Infinite loops
- **C – Array**
 - Introduction to array
 - Initialization & defining arrays
- **C – Functions**
 - Need of function
 - Function types & categories
 - no return type, no arguments
 - no return type, with arguments
 - with return type, no arguments
 - with return type, with arguments
 - Steps to create user defined functions
 - Practice & Understanding of functions with arguments

8 Bit MICROCONTROLLER (AVR)

- Features of microcontroller
- Pin out of microcontroller
- GP I/O Port specification
- Description about all Ports
- Description about IDE for programming

- Proteus Simulation for microcontroller
- I/O programming using Embedded C
- Led on/off programming
- Delay generation through function
- Led pattern programming
 - Data shifting from left to right & right to left
 - Curtain open/close programming
 - Even/odd bit toggling
- Sensor interfacing with microcontroller
 - LM35(Temperature Sensor)
 - RFID
 - RF Receiver/Transmitter
 - Accelarameter
 - IR Sensor
 - Gas Sensor
 - Alchohol Senser
 - Touch Screen
- Motor interfacing
 - Program for controlling direction of DC motor
 - Stepper motor
- 16x2 LCD Display
 - 16x2 LCD command & data register
 - Name/Data printing over LCD
 - Moving message display

Advanced features of Microcontroller

- **TIMER**
 - TIMER register explanations
 - Programming of TIMER
- **ADC**
 - ADC register explanations
 - Programming of ADC
 - Interfacing of temperature sensor
- **Serial communication**
 - Communication between microcontroller &
 - Computer system
- **Project as per Module**
 - SPI
 - I2C (RTC)