

## Embedded System in 25 Sessions

S.No:	Embedded System	Requirement
1	<b>Introduction of Embedded System</b> <ul style="list-style-type: none"> <li>• Intro with ES</li> <li>• Why ES</li> <li>• Application of ES</li> <li>• Difference b/w MP &amp; MC</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
2	<b>Intro with Microcontrollers</b> <ul style="list-style-type: none"> <li>• Type of Microcontrollers (8051,PIC,ARM,AVR,STM,ESP)</li> <li>• 8051 Microcontroller and its Architecture</li> <li>• AVR Microcontroller and its Architecture</li> <li>• Atmega328p Features</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
3	<b>Arduino IDE Software and Drivers Installation</b> <ul style="list-style-type: none"> <li>• Why Arduino</li> <li>• Arduino IDE Software Installation</li> <li>• Arduino Boards and its Types (Arduino UNO, Arduino Nano, Arduino MINI, Arduino MEGA)</li> <li>• USB to Serial Driver Installation</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
4	<b>Deep Learn About Arduino Nano Development Board</b> <ul style="list-style-type: none"> <li>• Arduino Nano Features</li> <li>• Arduino Nano PinOut</li> <li>• Arduino Nano Board Test</li> <li>• FTDI chips on Nano</li> <li>• CH340G</li> <li>• What is Bootloader</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
5	<b>Arduino IDE Functions</b> <ul style="list-style-type: none"> <li>• Digital I/O ( pinMode(), digitalWrite(),digitalRead() )</li> <li>• Analog I/O ( analogRead(), analogWrite() )</li> <li>• Time ( delay(), delayMicroseconds(), micros(), millis() )</li> <li>• Communication (Serial.print, Serial.println, Serial.begin)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
6	<b>Arduino IDE Variables</b> <ul style="list-style-type: none"> <li>• Constants (HIGH, LOW, INPUT, OUTPUT, true, false)</li> <li>• Data Types (array, char, double, float, int, long, short, string, byte, Boolean, unsigned char, unsigned int, unsigned long)</li> <li>• Structure (setup(), loop())</li> <li>• Control Structure (break,do..while, if,else, for, switch..case, while)</li> <li>• Further Syntax (#define , #include)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>

7	<b>LED Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Program for LED Blink</li> <li>• Array Model of LED Blink</li> <li>• Auto LED Fade</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
8	<b>7 Segment Display Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Type of 7 Segment Display</li> <li>• PinOut for 7 Seg Display</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• 7-segment Display Truth Table</li> <li>• SSD Testing</li> <li>• Programs for SSD</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
9	<b>Liquid Crystal Display- LCD Module Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Intro with LCD</li> <li>• Working Principal of LCD</li> <li>• Type of LCD</li> <li>• LCD 16X2 PinOut</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for LCD Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
10	<b>Motor Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Intro with Motors</li> <li>• Type of Motor (DC Motor, Servo Motor, Stepper Motor)</li> <li>• Motor Driver L293D Board working Function</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for DC motor Functions (Directions &amp; Speed )</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
11	<b>Servo Motor Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Servo Motor Working (PWM Control)</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for DC motor Functions (Directions &amp; Angles)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
12	<b>Buzzer Module Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Piezo Electric Effect</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Buzzer Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
13	<b>Switch &amp; Relays Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Switch Functions</li> <li>• Working Principal of Relay</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> </ul>

	<ul style="list-style-type: none"> <li>• Programing Practices for Relay Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Marker Board</li> </ul>
14	<b>Serial Communication on Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• UART Protocol (Universal Asynchronous Receiver/Transmitter)</li> <li>• Baud rate</li> <li>• I2C Protocol</li> <li>• In-system programming (ISP)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
15	<b>KeyPad Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Libraries installation</li> <li>• Programing Practices for keypad Functions (Serial Monitor Print, LCD Print)</li> <li>• Char to String Program</li> <li>• Password Comparing using String Function</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
16	<b>LDR Sensor Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• LDR Sensor Working Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for LDR Sensor (Digital Mode, Analog Mode)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
17	<b>IR Sensor Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• IR Sensor Working Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for IR Sensor (Digital Mode)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
18	<b>Design and Implementation of Digital Voltmeter using Nano Dev kit</b> <ul style="list-style-type: none"> <li>• VDB Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Digital Voltmeter (Analog to Digital Conversation )</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
19	<b>Design and Implementation of Digital Ohmmeter using Nano Dev kit</b> <ul style="list-style-type: none"> <li>• VDB Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Digital Ohmmeter (Analog to Digital Conversation )</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>

20	<b>Digital Temperature and Humidity (DHT11 Sensor)</b> <ul style="list-style-type: none"> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Libraries installation</li> <li>• Programing Practices for DHT11 Functions (Serial Monitor Print, LCD Print)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
21	<b>PIR Sensor Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• PIR Sensor Working Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for PIR Sensor (Digital Mode)</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
22	<b>Gas Sensor interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Gas Sensor Working Principal</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Gas Sensor (Analog and Digital Modes)               <ol style="list-style-type: none"> <li>1. Methane Gas</li> <li>2. LP Gas</li> <li>3. CO</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
23	<b>Bluetooth Module interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• Bluetooth technology</li> <li>• UART Communication in BT</li> <li>• Android App Design and Develop for BT</li> <li>• Bluetooth Home automation</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Gas Sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
24	<b>RFID Reader interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• RFID Technology</li> <li>• UART Communication in RFID</li> <li>• RFID Tag</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Gas Sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>
25	<b>GPS Module Interface with Nano-Dev kit</b> <ul style="list-style-type: none"> <li>• GSP Technology</li> <li>• Lat &amp; Lon extraction</li> <li>• Construct Block Diagram &amp; Circuit Diagram</li> <li>• Programing Practices for Gas Sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• PC / Computer lab With internet</li> <li>• Marker Board</li> </ul>

<b>Student Kit Consists</b>	
<b>S.No</b>	<b>Modules</b>
1	Arduino Nano Board
2	Mini B type USB Data Cable
3	LCD 16X2
4	Nano Development Kit ( <b>Nano-Dev Kit</b> )
5	12V 1A Adapter
6	Wires
7	IR Sensor
8	LDR Sensor
9	PIR Sensor
10	DHT 11

<b>Trainer Kit Consists (Company Side Kit )</b>	
<b>S.No</b>	<b>Modules</b>
1	Bluetooth Module
2	RFID Reader Module
3	GPS Module
4	GSM Module
6	RF Module
7	Gas Sensors
8	Automation Kit
9	Fingerprint Sensor

### **Student Benefits:**

- 1) End of Program Student Learn about industrial type PCB Design and Fabrication
- 2) Abbreviation Manual
- 3) Certificate from Pvt. Ltd Company.
- 4) The Student how have best perform of entire Program get Award 1,2&3 Positions 5) Top 3 innovative Ideas, Get Featured in [www.vishishtainnovator.com](http://www.vishishtainnovator.com) 6) Life time Member of Vishishta innovators. 7) They own the Mini Electronic Lab Kit.

**Fee: 2550/- with Student Kit**