





Industry Oriented Certified Training Program on Embedded Systems (AVR) and Robotics

This is a Training which is best suited to beginners who are taking their first step towards robotics. This Training basically deals with designing various kinds of electronic sensors and circuits and their use in making autonomous robots by using a microcontroller. After the workshop students come up with a Wired Robot, Wireless Robot, Line tracking robot, Sound operated robot, Computer Controlled Robots and many more...





Course Certification: Certified by Nutan Infotronics Pvt. Ltd.

Course Duration: 45 Hr.




Introduction to Embedded Systems

-  What is Embedded System
-  Necessity of Embedded System in Today's world






Introduction to AVR ATmega8/16/32 Basic Features

-  Why AVR Microcontrollers
-  AVR Architecture
-  Pin out of ATmega8/16/32
-  I/O Registers






Programming ATmega8/16/32

-  Compiler and Developer
-  Project Setup
-  Burning ATmega8/16/32







Interfacing of simple I/O Devices

-  LED Interfacing
-  LCD Interfacing
-  Keypad Interfacing
-  Relay Interfacing
-  Switches






Analog to Digital Conversion (ADC)

-  Introduction to ADC
-  ADC Modes (Free Running and Single Conversion Mode)
-  ADC Registers
-  Programming ADC
-  Displaying ADC Value on LEDs







Sensors

-  Temperature Sensor
-  TSOP1738 (Light Sensor)
-  IR-Photodiode (Light Sensor)
-  Light Dependent Resistor (Light Sensor)
-  Accelerometer (Motion Sensor)
-  Touch Screen (Touch Sensor)





Universal Synchronous and Asynchronous Receiver & Transmitter (USART)

-  Introduction to USART
-  Synchronous and Asynchronous Serial Communication
-  USART Registers
-  Programming USART
-  Rx/Tx Pair Wired and Wireless Communication






Wireless Modules

-  RF 434 Rx/Tx Wireless Communication
-  4 bit Encoder and Decoder Circuits
-  ZigBee (XBee) Wireless Communication
-  Global System for Mobile (GSM) Module
-  Global Positioning System (GPS) Module
-  Radio Frequency Identification (RFID) Module




Motors Interfacing






-  DC Gear Motor Interfacing
-  Driving DC Gear Motor according to Application
-  Servo Motor Interfacing
-  Driving Servo Motor according to Application

Timers/Counters and Pulse width Modulation (PWM)












-  Introduction to PWM by using Timers/Counters
-  Different Wave Generation Modes of Timers/Counters
-  PWM Generating Strategy
-  Displaying PWM on LED
-  Manipulating Speed of DC Gear Motor by PWM

Robotics

-  Obstacle Avoider Robot
-  Line Follower Robot
-  Edge Avoider Robot

-  Haptic System based Robot
-  Touch Screen controlled Robot
-  PC Controlled Robot
-  Wirelessly controlled Robot
-  Speed Manipulator Robot





Projects Covered

-  Visitor Counter
-  Touch Screen controlled appliances
-  Location Finder using GPS Receiver
-  Password based Authentication system
-  Home Automation System
-  Mobile Making
-  Automated attendance system with RFID
-  GSM controlled Home appliances
-  Cellphone controlled SMART HOME
-  Accelerometer based Movement Control
-  Touch Screen controlled Machine




Quiz & competition

Prize & Certificate Distribution

The Training program has following highlights

-  Training program introduces the students to concepts or robotics.
-  As the training program focuses on practical and project work it manifests the concepts from the regular school curriculum in better and simpler way than the regular school sessions.
-  The students are trained by the industry experts having hundreds of hours of training experience under their belt.
-  The course is designed in such a way that we provide personal attention to every student and look up to the student as future Einstein.

What students get

-  Practical and hands-on technical knowledge of Robotics.
-  Familiarity with the various electronic components and other devices used in robotics.
-  Application of the knowledge to solve the problem. (Troubleshooting)



Application of the knowledge and skills to implement an idea to work. (Applied Science)



Inspired to innovate.



Challenged to give best. (Project competition)



Foundation for the advanced learning.



Basic awareness about advanced topics like kinematics, control, dynamics, motion planning, trajectory generation, programming and design.

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