



## Embedded Systems Design Using Arduino Controllers

Course Fee	Rs 8,260/- (inclusive of taxes)	Duration	15 sessions (two hours per session)
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**Summary:** This course is designed for those who are interested in hobby electronics, robotic control project development and need to learn programming and hardware in a short time without extensive knowledge of microcontrollers. Students in school and fresher engineering students are interested in this topic to start participating in science fairs and robotic contests.

**Prerequisites:** Basic knowledge of electronics, familiarity with use of computers, passion for electronics.

**Audience:** Students in middle/high school and first/second year of undergraduate courses

### Course Contents

1. Introduction to Arduino
  - Setting up your computer
  - Programming concepts
2. Programs with LEDs
  - a. Blinking, Fading, Creating patterns
  - b. Traffic light Programs
3. Reading digital inputs and sending digital outputs
  - a. Interfacing switches, sensors
  - b. Interfacing relays, buzzers, segment displays, LCDs
4. Reading analog inputs
  - a. Reading voltage from potentiometer, joystick
  - b. Reading temperature sensors, 4-20mA transmitters
5. Pulse width modulation
  - a. DC motor control
  - b. Tone generation
6. Robotic control systems – sensors, power electronics and control systems

Programming examples using Arduino library functions will be taught to demonstrate the capability of these controllers for sensing, processing and control applications in the area of instrumentation and robotics. Students will build circuits that demonstrate the capability of interfacing these controllers with display devices, DC motors, servo motors that are commonly used in robotics. Interface with joystick controllers, potentiometers and keypad switches will be learnt in this course. Use of Arduino in remote control applications will also be taught so that the student can build similar subsystems for automation.

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