



## Practical Training Programs

With the aim to spread high level knowledge based practical education, we introduce our state of art training center with all advance facilities and unique course modules.

All our trainers have industry exposure and have worked on many commercial products. Our training equipments have been designed and developed in-house, which gives students an opportunity to see complete product development cycle.

All of our training programs are offered in-campus as well as at our training centers. Details can be found over leaf.

### \* Our Training Centers \*

Bhawarkua | Annapurna | Palasiya | Rajmohalla

**Head office Indore:** 2<sup>nd</sup> floor, sunderam complex,  
above canara bank bhawarkuan , Indore-452001

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### Our Partners:



## Foundation Course

### Session : 1 Basics of Electronics

➤ Resistor, Disc capacitor, Electrolytic capacitor, LED, Crystal oscillator, LCD Display, 7-segment display, Matrix keypad, DC Motor & Driver, Stepper Motor & Driver, DTMF Decoder, IR LED, IR sensor, IR Photo diode, 4 bit Encoder/ Decoder and wireless Session : : etc.

### Session : 2 Introduction

- Bread Board and testing Standard testing procedure
  1. Power Supply
  2. Motor Driver
  3. LDR
  4. 555 Timer

### Session : 3 Circuit Simulation

- Introduction of PROTEUS
- Familiarization with environment and tools
- Basics of Schematic Entry
- Study of in-built instruments
- Power Supply with simulation

### Session : 4 PCB Designing

- Introduction to PCB technologies
- Familiarization with through hole components and packaging
- Familiarization with SMD components and packaging
- Schematic Drawing
- Board Layout

### Session : 5 Projects

- Work on Projects

### Session : 6 Introduction

- Introduction to MCUs 8051, PIC, AVR. Architecture of 8051
- Applications of embedded systems

### Session : 7 Embedded C

- Introduction to embedded C
- Variable Types and Constants
- Operators, Flow Control
- Functions, Arrays
- Introduction to compiler and IDE
- Uploading of programs

### Session : 8 Hardware interfacing

- LED Interfacing

#### Duration

Duration: 15 Days

#### Benefits

10% discount on any RoboZZ Lab's product

Group discount of 10% on a batch of 10 students and above.

## PCB Designing & Fabrication

### Session : 1 Introduction

- Introduction to different PCB technologies
- Familiarization with through hole components
- Familiarization with SMD components
- Reading, calculating values of different components
- Introduction to terminology used in PCB designing

### Session : 2 Schematic Making

- Understanding schematics and symbols
- Searching components footprints and symbols
- Choosing of right components
- Schematic drawing
- Editing symbol libraries
- Running ERC

### Session :3 Board creation

- Auto-routing v/s manual routing
- Component placing
- Understanding layers on PCB
- Practice via manual routing on numerous PCBs
- Design verification
- Editing of package libraries
- Designing of double sided PCBs

### Session : 4 Report Generation

- Gerber ,net list, BOM, drill legend generation
- Printing different layers of PCB
- Practice on EAGLE 3D

### Session : 5 Fabrication

- Introduction to PCB printing technology
- Printing of design on copper clad
- Proper etching process
- Drilling of PCB

### Session : 6 Soldering

- Component soldering on PCB

#### Duration

Duration: 7 Days

#### Benefits

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## Embedded Systems-Arduino

### Session : 1 Basics of Electronics

➤ Resistor, Disc capacitor, Electrolytic capacitor, LED, Crystal oscillator, LCD Display, 7-segment display, Matrix keypad, DC Motor & Driver, Stepper Motor & Driver, DTMF Decoder, IR LED, IR sensor, IR Photo diode, 4 bit Encoder/ Decoder and wireless Session : : etc.

### Session : 2 Introductions to Arduino

- Architecture of ATmega8
- AVR hardware Detail- I/O Port
- AVR Clock Oscillator
- Difference between Microcontroller and Microprocessor

### Session :3 Programming in Embedded C

- Basic of C Programming for Arduino
- Basic function uses in C Programming
- Conditional operators if else, switch etc.
- Loops- while, for etc.

### Session :4 Interfacing with AVR

- LED Interfacing
- Relay & Buzzer Interfacing
- DC Motor with Interfacing
- 16x2 LCD display Interfacing
- Serial port Interfacing
- Matrix Keypad Interfacing
- 7-Segment Display Interfacing
- Mobile (DTMF) Interfacing
- Infra-red Sensors Interfacing
- Wireless Session : : Interfacing
- Analog to Digital Converter Interfacing

### Session : 5 Project realizations

- Obstacle avoiding Robot
- Line Following Robot
- Mobile control Robot
- Wireless controlled Robot

### Session : 6 PCB Fabrication - Live Demo

- Introduction to PCB hole
- components and packaging
- Familiarization with SMD
- components and packaging
- Schematic Drawing
- Board Layout

#### Duration

Duration: 45 Days

#### Benefits

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## Embedded Systems-8051

### Session : 1 Basics of Electronics

➤ Resistor, Disc capacitor, Electrolytic capacitor, LED, Crystal oscillator, LCD Display, 7-segment display, Matrix keypad, DC Motor & Driver, Stepper Motor & Driver, DTMF Decoder, IR LED, IR sensor, IR Photo diode, 4 bit Encoder/ Decoder and wireless Session : : etc.

### Session : 2 Introductions to 8051 MCU

- Architecture of 8051 core AT89S52
- 8051 hardware Detail- I/O Ports
- 8051 Clock Oscillator
- Reset circuit
- On Chip Peripherals
- Intro of In-system-Programmer (Burner)

### Session : 3 Programming in Embedded C

- Basic of C Programming for 8051
- Basic function uses in C Programming
- Conditional operators if else, switch etc.
- Loops- while, for etc.

### Session : 4 Interfacing with 8051

- LED Interfacing
- Relay & Buzzer Interfacing
- DC Motor with Interfacing
- 16x2 LCD display Interfacing
- Serial port Interfacing
- Matrix Keypad Interfacing
- 7-Segment Display Interfacing
- Mobile (DTMF) Interfacing
- Infra-red Sensors Interfacing
- Wireless Session : : Interfacing
- Analog to Digital Converter Interfacing

### Session : 5 Project realizations

- Obstacle avoiding Robot
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- Mobile control Robot
- Wireless controlled Robot

### Session : 6 PCB Fabrication - Live Demo

- Introduction to PCB technologies
- Familiarization with through hole components and packaging
- Familiarization with SMD components and packaging
- Schematic Drawing
- Board Layout

#### Duration

Duration: 45 Days

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## Basic Robotics

### Session : 1 Introduction to Robotics

- Terminology involved in robotics
- History of Robotics

### Session : 2 Basics of Electronics & Mechanics

- Designing of Power Supplies
- Study Of Multimeter
- Different type of motors
- Different Drives
- Different type of gears & calculation

### Session : 3 Study of Sensors

- Project:
  - ✓ Obstacle Avoiding Robot
  - ✓ Edge Avoiding Robot

### Session : 4 Study of color sensor

- Project:
  - ✓ Line Following Robot

### Session : 5 Study of DTMF

- Project:
  - ✓ Cell Phone Controlled Robot

### Session : 6 PCB Designing

- Introduction to PCB technologies
- Familiarization with through hole components and packaging
- Familiarization with SMD components and packaging
- Schematic Drawing
- Board Layout

### Session : 7 PCB Fabrication - Live Demo

#### Duration

Duration: 15 Days

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## Advance Robotics-Arduino

### Session : 1 Introduction to Robotics

- Terminology involved in robotics
- History of Robotics

### Session : 2 Basics of Mechanics

- Types of locomotion
- Different drives
- Different types of motors and their selection
- Steering mechanisms
- CG, torque calculation
- Different types of gears and calculations

### Session : 3 Basics of Electronics

- Component identification and usage
- Basics of circuit designing
- Concepts and principals of sensors

### Session : 4 Introductions to Arduino

- Architecture of ATmega8
- AVR hardware Detail- I/O Ports
- AVR Clock Oscillator
- Difference between Microcontroller and Microprocessor

### Session : 5 Basics of Embedded C

- Introduction to various 8 bit
- Architecture of 8051
- C Coding and compiling
- Variable Types and Constants
- Boot loading
- Interfacing microcontroller with motors, actuators, sensors, LCD, LED on Robot Controller

### Session : 6 Robotics Project with MCU

- Obstacle avoiding robot
- Line following robot
- Edge avoiding robot
- Light following robot
- Cell Phone controlled Robot
- Bluetooth controlled robot
- Gesture controlled robot
- Android Smart phone controlled robot

### Session : 7 Robotics Project Demo

- Wireless controlled robot
- voice controlled robots
- PC controlled robots

#### Duration

Duration: 30 Days

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## Advance Robotics - 8051

### Session : 1 Introduction to Robotics

- Terminology involved in robotics
- History of Robotics

### Session : 2 Basics of Mechanics

- Types of locomotion
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- On Chip Peripherals
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### Session : 5 Basics of Embedded C

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- Architecture of 8051
- C Coding and compiling
- Variable Types and Constants
- Boot loading
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### Session : 6 Robotics Project with MCU

- Obstacle avoiding robot
- Line following robot
- Edge avoiding robot
- Light following robot
- Cell Phone controlled Robot
- Bluetooth controlled robot
- Gesture controlled robot
- Android Smart phone controlled robot

### Session : 7 Robotics Project Demo

- Wireless controlled robot
- voice controlled robots
- PC controlled robots

#### Duration

Duration: 30 Days

#### Benefits

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## MATLAB

### Session : 1 Exploring MATLAB

- Getting familiarized with Matlab
- Signal representation in Matlab
- Built-in functions.
- Expressions
- Matrix and array operations
- Functions in MATLAB

### Session : 2 Exploring MATLAB

- M-Files
- Scripts and functions
- Graphics basics
- 2D plot, 3D Plots
- Multiple plots

### Session : 3 Programming

- Programming
- Conditions and selections
- Menu command
- Display command
- Data Import and Export

### Session : 4 Graphical user interface

- Creating Graphical user interface
- Using GUIDE
- Designing the GUI
- Laying Out the GUI

### Session : 5 Graphical user interface-II

- GUI FIG-Files and M-Files
- Programming the GUI
- Understanding Callbacks

### Session : 6 Handling Images in MATLAB

- Connecting the hardware (webcam) and retrieving hardware information.
- Using the Image acquisition toolbox

### Session : 7 Image Processing Approaches & Image Enhancement Techniques

- Types of image in MATLAB
- Reading and Writing Image Data
- Image Type conversions
- Converting Between Image Classes
- Coordinate Systems
- Displaying and Exploring Images

### Session : 8 Data Communication using MATLAB

- performed for playing with external devices
- Create an object for accessing port
- Configure, start and stop an objects
- Controlling the machine through ports
- Developing navigation functions

#### Duration

Duration: 30 Days

#### Benefits

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## ARM Controller

### Session : 1 Introduction

- Introduction of ARM Processors
- Evolution of ARM
- 32 - bit Programming

### Session : 2 ARM7 Architecture

- ARM7 Architecture
- Instruction Set Architecture
- LPC21xx/LPC22xx Description
- Memories
- Peripherals

### Session : 3 ARM Processor Programming

- ARM Processor Programming in C
- Startup code
- Internetworking of arm/thumb code
- Using ARM Programming Tools
- Debugging Techniques (JTAG)

### Session : 4 I/O Device Interface and practical

- Study of Input Output Devices
  - o LED Display
  - o Intelligent LCD Display
  - o Stepper Motors and Types of Stepper Motors
  - o Serial Communication Concepts
  - o I2C
  - o SPI
  - o Practices on Boards

### Session : 5 Advance Peripheral usage

- Analog to Digital Converter
- Digital to Analog Converter
- Pulse Width Modulator
- Watchdog Timer
- Practices on Board

### Session : 6 Conclusion

- ·Latest trends in ARM Processor
  - Introduction to ...
  - o ARM9
  - o RTOS
  - o Embedded Linux on ARM

#### Duration

Duration: 60 Days

#### Benefits

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## PLC Programming & SCADA

### Session : 1 Basics of electrical

- AC/ DC Principles
- Hydraulics & Pneumatics.
- Electrical symbols used in Industries,
- 1Phase & 3Phase power supply.

### Session : 2 PLC Details

- History of PLC,
- Difference between relay, contactor & PLC logic, PLC architecture.
- A detail description PLC Session : :s & cards

### Session : 3 I/O configuration & Memory

#### Mapping

- Why I/O configuration is required?
- How the I/O Session : :s are addressed for Messung, Mitsubishi, Delta , AB & Siemens – PLCs

### Session : 4 Programs & Ladder diagrams

- First steps with the programming device, introducing the basic ladder logic instructions, contacts, coils, and PLC scan.

### Session : 5 The instruction Set

- A look at the instructions covered in all the PLC. Each instruction being illustrated by application specific program examples. The instructions covered are:-  
NO/NC, Set, Reset, Timers, Counters, Comparison, Arithmetic, Logical & Move functions

### Session : 6 Communications & fault finding

- An introduction to communication options available for the type of PLCs includes also how to find hardware faults and probable causes.

### Session : 7 SCADA

- Introduction to SCADA,
- Configuration of different drivers, gateway.
- Database of tags and its use.
- Interfacing with PLC and simulation of PLC application in SCADA.

#### Duration

Duration: 30 Days

#### Benefits

10% discount on any RoboZZ Lab's product

Documentation CD

## VLSI Design

### SESSION : 1

- Introduction to Electronic Industry
- Project & Product Demonstration
- Introduction to VLSI
- VLSI Design Flow
- Classification of VLSI Domains
- Introduction to Digital Circuit Designing

### SESSION : 2

- Xilinx EDA Tool Introduction
- IC designing using schematic as TLM
- Assignments on Schematic
- Design Entry form of IC designing
- Test Bench writing for Design
- verification and testing

### SESSION : 3

- HDL as TLM Introduction
- Types of HDL (VHDL/Verilog Intro)
- VHDL Abstraction
- Data Flow Modeling Style
- Assignments on Dataflow Modeling Style
- ISE Simulator with forced Test inputs
- Other Simulation Tool Modelsim/Quarta Introduction`

### Session : 4

- Structural Modeling Style
- Assignments on Structural Modeling Style Modeling
- Modelsim Simulator
- Assignments Continued
- Behavioral Modeling Style
- Assignments on Behavioral Modeling Style
- Modelsim Simulator Testing & Verification

### Session : 5

- FPGA CPLD Architectural Difference & Mixed Modeling
- VLSI Development Platform FPGA/CPLD Board Architecture Overview
- Board Level Implementation of Hardware Designs
- Assignments to implement designs on Boards
- IC Design Project Realization
- Specification, Modeling and simulation of project on Xilinx EDA

### Session : 6

- Project Implementation on FPGA/CPLD boards. Hardware Verification of IC Design

#### Fees & Duration

Fees: Rs 4000  
Duration: 7 Days

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## Note : Microcontroller Knowledge Required

- Introduction to RFID
- Study of various protocols and frequencies
- Study of Encoder ICs
- Interfacing of RFID readers with MCUs
- Reading/writing Mifare cards

### Radio Frequency Identification

#### Duration

Duration: 5 Days

### Wireless Communication

#### Duration

Duration: 10 Days

- Study and interfacing of GSM/GPRS
- Study and interfacing Bluetooth
- Study and interfacing of ZIGBEE
- Study and interfacing of CC2500
- Study and interfacing of GPS

### Touch Technologies

- Introduction to Touch Technologies
- Study of different types of touch sensors
- Interfacing of capacitive touch sensors
- Interfacing of Resistive touch screens
- HMI development

#### Duration

Duration: 5 Days

### Advance Sensors

#### Duration

Duration: 10 Days

- Study and interfacing of Humidity sensors
- Study and interfacing of Accelerometers
- Study and interfacing of Finger print readers
- Study and interfacing of barcode scanner
- Study and interfacing of PIR sensors
- Study and interfacing of Ultrasonic sensors
- Study and interfacing of Rotatory Encoders
- Study and interfacing of Capacitive/inductive proximity sensors

## Why RoboZZ Lab?

- The Best Practical lab
- PPT Presentation Lectures
- Best course Material provided by us
- Guidance for Placement & Interview
- Hands on Experience on Live Project
- Focus on Deep Theory & More Practical
- Updated Training Report & Study material
- Experts Lectures about how industry works
- Exposure to Our practical with Real Life Implementation

### Placement Opportunities

Below IT Companies Hired Resources @ Online/Octopus

		
		
		
		

Also, we invited many other IT Companies to conduct their campus recruitment process at our centers. We provided placements to more than 150 students in last 3 years.