TINKER CODERS
BEYOND CODING

# VIRTUAL ROBOTICS

## GRADE 6-8

## COURSE HIGHLIGHTS !

- Live 48 Hours of Sessions
- Detailed coverage of fundamentals of Arduino (C++) programming language
- Basic knowledge of electronics & learn to design your circuits
- Understanding the working of robotic brain
- Interfacing various sensors & hardware's
- Robotics Concepts
- Understanding Errors & its types, Debugging the errors
- Understanding Digital & Analog Signals
- **BUILD 7 REAL LIFE PROJECTS**

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# COURSE REQUIREMENTS

- Basic knowledge of Block-Based Programming Required
- Basic knowledge of circuit
- A Mac or Windows PC computer/Laptop
- Access to the internet

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# WHAT YOU'LL LEARN IN THE COURSE

- The Arduino Platform & C Programming
- The Arduino Programming & Hardware Fundamentals
- Interfacing various Sensors such as Ultrasonic, Temperature, Gas etc.
- Interfacing Actuators such as DC motor, Servo Motor, Buzzer, Displays etc.
- Flow control of Program & Algorithm

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**Beginner**

**Grade 6-8**

START

## Introduction to the Breadboard

- Introduction of basic electronics

## Bright up

- Introduction of working of LED
- LED Glowing on breadboard

## Introduction to Arduino Programming

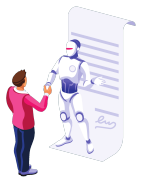
- Introduction of Arduino hardware

## Turn on the lights

- Use of LED
- Control led by using arduino

## Controlling lights

- Introduction to switch
- Input & Output Relation



## Controlling brightness of light

- Use of Potentiometer
- Concept of Mapping

## Decoration Lights

- Introduction of Loop concept
- Glowing Multiple LED in sequence

## Smart Street lamp

- Introduction of AnalogRead concept
- Connection with LDR

## Disco colors

- Introduction Rgb led
- Mix color by using switch

## Number Counter

- Introduction of function concept
- Pin Configuartion for 7 segment display

## Digital Dice

- Introduction of random function concept
- How to glow digital number randomly

## Microwave temperature indicator

- Introduction of indicator

## Controlling fan

- Introduction to motors
- Dc motors and Its use

## Rotating CCTV camera

- Introduction of servo motor

## Smart Street lamp

- Introduction of AnalogRead concept
- Connection with LDR

## Intruder Alarm

- Intruder Alarm

## Print your message on LCD

- Introduction of LCD
- Printing message on LCD

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# Intermediate

## Grade 6-8

### Fading lamp
- Introduction of analog Write concept
- Showing fading effect on led

### Rainbow Lights
- Pwm concept Introduction
- Mixing colors on Rgb Led to make rainbow color

### Smart Parking System
- Working of distance sensor(Ultrasonic)
- Checking the slot for parking

### Score Board
- Introduction of score concept

### Visitor Counter
- Concept of measurement of the visitor traffic entering and
- exiting conference rooms, malls, sports venues, etc

### Blind Stick
- System to avoid obstacle

### Voting Machine
- Multiple connection with switches
- Sending the message on lcd by using switch

### Height measuring device
- Measuring height by using distance sensor
- Convert one unit into another unit like cm into inches etc

### Automatic door opening system
- Use of looping Statement
- Controlling servo motor according to pir sensor detection

### Temperature Controlled Fan
- Reading Analog value for sensor
- Controlling motor by using temperature sensor

### Robotic Arm
- Concept of robotic arm
- Controlling multiple servo motor using multiple regulator(Potentiometer)

### Automatic hand sanitizer
- Ultrasonic sensor and its connection
- Controlling servo motor according to distance of hand from sanitizer

### Fire Alarm
- Introduction of gas sensor
- working of gas sensor

### Smart Dustbin
- how to control opening of dustbin according to distance of trash form the dustbin

### Piano
- Concept of different tone
- How to make different tone by using switch

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**Expert**

**Grade 6-8**

## 4 way Traffic Lights
- Concept of array
- Use of for loop to control alternate leds

## Remote control Lights
- Changing the color of Rgb leds by using remote
- Taking commands from Remote

## Mood lights
- Introduction of rgb strip
- Working of rgb strip

## Air Quality monitoring system
- Detect the quality of air using gas sensor
- Working with Analog value

## Smart Irrigation system
- Use of Soil moisture sensor
- Controlling pump with sensor wrt to moisture level

## Password setup
- Introduction of keypad
- Connecting Keypad with arduino

## Rock paper scissor
- Making a game between player and arduino
- Display score on LCD

## Don't drink and drive
- Control motor according to detection of alcohol

## Robo Car
- Controlling motor for moving robot in different direction

## Obstacle avoiding car
- Make a robot to avoid obstacle
- Use of relational Statement

## Door lock
- Make a password protected system for our door locks
- Matrix and Its use

## Smart home
- Serial Communication and Its Introduction

END

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# HOW THIS COURSE WILL HELP YOUR CHILD

- **CIC approach**
  Consumer to innovator to the creator

  This course aims to turn the student from a consumer of technology to the creator of technology.

- **Activity-Based learning**
  Learn the required programming concepts by performing activities

- **Project - Based Learning**
  Learn the required programming concepts by performing activities
  Instead of a theoretical and traditional way of learning, students will build projects during the course.

- **Our PBL approach will help student in**
  Allows students to acquire key knowledge & skills through the development of projects that respond to real-life problems
  Develop critical thinking

  Retain the concept

  Integration of different concepts

# COURSE OUTLINE

## Beginner

| Session Number | Activity name | Learning Outcome |
|---|---|---|
| 1. | Introduction to the breadboard. | Introduction of basic electronics<br>Circuit and circuit connection on breadboard |
| 2. | Bright up | Introduction of working of LED<br>LED Glowing on breadboard |
| 3. | Introduction to Arduino Programming | Introduction of Arduino hardware<br>Software and programming for arduino |
| 4. | Turn on the lights | Use of LED<br>Control led by using arduino |
| 5. | Controlling lights | Introduction to switch, Input and output relation<br>Controlling led with switch<br>Concept of if-else |
| 6. | Controlling brightness of light | Use of Potentiometer<br>Concept of Mapping<br>How to control brightness of led using regulator (Potentiometer) |
| 7. | Decoration Lights | Introduction of Loop concept<br>Glowing Multiple LED in sequence |
| 8. | Disco colors | Introduction Rgb led<br>Mix color by using switch |
| 9. | Number Counter | Introduction of function concept<br>Pin Configuartion for 7 segment display<br>Glow Digital Number from 0 to 9 |
| 10. | Digital Dice | Introduction of random function concept<br>How to glow digital number randomly |
| 11. | Microwave Temperature indicator | Introduction of indicator<br>Use of Temperature sensor |
| 12. | Controlling Fan | Introduction to motors<br>Dc motors and Its use<br>motor controller(motor driver) |
| 13. | Rotating CCTV Camera | Introduction of servo motor<br>Rotating motor from 0 degree to 180 degree |
| 14. | Smart Street lamp | Introduction of AnalogRead concept<br>Connection with LDR<br>Led brightness according to the amount of sunlight |
| 15. | Intruder Alarm | Intruder Alarm<br>Making a theft protection alarm system |
| 16. | Print your message on LCD | Introduction of LCD<br>Printing message on LCD |
| 17. | Digital Distance meter | Introduction of distance sensor(Ultrasonic sensor)<br>Displaying distance on LCD |

# COURSE OUTLINE

## Intermediate

| Session Number | Activity name | Learning Outcome |
|---|---|---|
| 1. | Fading lamp | Introduction of analogWrite concept<br>Showing fading effect on led |
| 2. | Rainbow Lights | Introduction of Pwm concept<br>Mixing colors on Rgb Led to make rainbow color |
| 3. | Smart parking system | Working of distance sensor(Ultrasonic)<br>Checking the slot for parking |
| 4. | Score board | Introduction of score concept |
| 5. | Visitor counter | Concept of measurement of the visitor traffic entering and exiting conference rooms, malls, sports venues, etc<br>Displaying numbers |
| 6. | Voting Machine | Multiple connection with switches<br>Sending the message on lcd by using switch |
| 7. | Blind Stick | Explaining Problem face by blind person day to day life<br>System to avoid obstacle |
| 8. | Height measuring device | Measuring height by using distance sensor<br>Convert one unit into another unit like cm into inches etc |
| 9. | Automatic door opening system | Use of looping Statement<br>Controlling servo motor according to pir sensor detection |
| 10. | Temperature controlled Fan | Reading Analog value for sensor<br>Controlling motor by using temperature sensor |
| 11. | Robotic Arm | Concept of robotic arm<br>Controlling multiple servo motor using multiple regulator(Potentiometer) |
| 12. | Automatic hand sanitizer | Ultrasonic sensor and its connection<br>Controlling servo motor according to distance of hand from sanitizer |
| 13. | Fire Alarm | Introduction of gas sensor<br>working of gas sensor<br>Detecting fire by using gas sensor |
| 14. | Smart dustbin | how to control opening of dustbin according to distance of trash form the dustbin |
| Project. | Piano | Concept of different tone<br>How to make different tone by using switch |

# COURSE OUTLINE

## Expert

| Session Number | Activity name | Learning Outcome |
|---|---|---|
| 1. | 4 way Traffic Lights | Concept of array<br>Use of for loop to control alternate leds |
| 2. | Remote control Lights | Changing the color of Rgb leds by using remote<br>Taking commands from Remote |
| 3. | Mood lights | Introduction of rgb strip<br>Working of rgb strip<br>Change the color of rgb strip according to temprature |
| 4. | Air Quality monitoring system | Detect the quality of air using gas sensor<br>Working with Analog value |
| 5. | Smart Irrigation system | Use of Soil moisture sensor<br>Controlling pump with sensor wrt to moisture level |
| 6. | Password setup | Introduction of keypad<br>Connecting Keypad with arduino |
| 7. | Rock paper scissor | Making a game between player and arduino<br>Display score on LCD |
| 8. | Don't drink and drive | Control motor according to detection of alcohol |
| 9-10. | Robo Car | Controlling motor for moving robot in different direction |
| 11-12. | Obstacle avoiding car | Make a robot to avoid obstacle<br>Use of relational Statement |
| 13-14. | Door lock | Make a password protected system for our door locks<br>Matrix and Its use |
| 15-16. | Smart home | Serial Communication and Its Introduction<br>Use of bluetooth(HC-05)<br>Controlling multiple devices of home with different sensor |

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# OTHER COURSES

- Web development
- Game Development
- Android & iOS Application Development
- Python
- App Development
- Artificial Intelligence & Machine learning

## FOR MORE COURSES VISIT:


www.tinkercoders.com

+91 99711 92244 , +91 99711 97744

info@tinkercoders.com