



**TINKER CODERS**  
BEYOND CODING

# VIRTUAL ROBOTICS

## GRADE 9-12



### 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**



Book your  
**FREE Demo now!**

[www.tinkercoders.com](http://www.tinkercoders.com)





**TINKER CODERS**  
BEYOND CODING



## COURSE REQUIREMENTS



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





**TINKER CODERS**  
BEYOND CODING



# 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**





**Beginner**

**Grade 9-12**

## Introduction to the Breadboard

- Introduction of basic electronics



START ▶

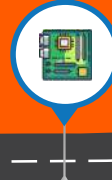


## Bright up

- 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



### 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

### Voting Machine

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



### Blind Stick

- System to avoid obstacle



### 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

### 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





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



# COURSE OUTLINE

## Intermediate

Session Number	Activity name	Learning Outcome
1.	Fading lamp	Introduction of analogWrite concept Showing fading effect on led
2.	Rainbow Lights	Introduction of Pwm concept Mixing colors on Rgb Led to make rainbow color
3.	Smart parking system	Working of distance sensor(Ultrasonic) 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 Displaying numbers
6.	Voting Machine	Multiple connection with switches Sending the message on lcd by using switch
7.	Blind Stick	Explaining Problem face by blind person day to day life System to avoid obstacle
8.	Height measuring device	Measuring height by using distance sensor Convert one unit into another unit like cm into inches etc
9.	Automatic door opening system	Use of looping Statement Controlling servo motor according to pir sensor detection
10.	Temperature controlled Fan	Reading Analog value for sensor Controlling motor by using temperature sensor
11.	Robotic Arm	Concept of robotic arm Controlling multiple servo motor using multiple regulator(Potentiometer)
12.	Automatic hand sanitizer	Ultrasonic sensor and its connection Controlling servo motor according to distance of hand from sanitizer
13.	Fire Alarm	Introduction of gas sensor working of gas sensor 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 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 Use of for loop to control alternate leds
2.	Remote control Lights	Changing the color of Rgb leds by using remote Taking commands from Remote
3.	Mood lights	Introduction of rgb strip Working of rgb strip Change the color of rgb strip according to temprature
4.	Air Quality monitoring system	Detect the quality of air using gas sensor Working with Analog value
5.	Smart Irrigation system	Use of Soil moisture sensor Controlling pump with sensor wrt to moisture level
6.	Password setup	Introduction of keypad Connecting Keypad with arduino
7.	Rock paper scissor	Making a game between player and arduino 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 Use of relational Statement
13-14.	Door lock	Make a password protected system for our door locks Matrix and Its use
15-16.	Smart home	Serial Communication and Its Introduction Use of bluetooth(HC-05) Controlling multiple devices of home with different sensor





**TINKERCODERS**  
BEYOND CODING





## OTHER COURSES





## FOR MORE COURSES VISIT:

 [www.tinkercoders.com](http://www.tinkercoders.com)

  +91 99711 92244 , +91 99711 97744

 [info@tinkercoders.com](mailto:info@tinkercoders.com)