Basic
Electronics
& Circuits
Curriculum

THE MUMBAI CODING LAB

START

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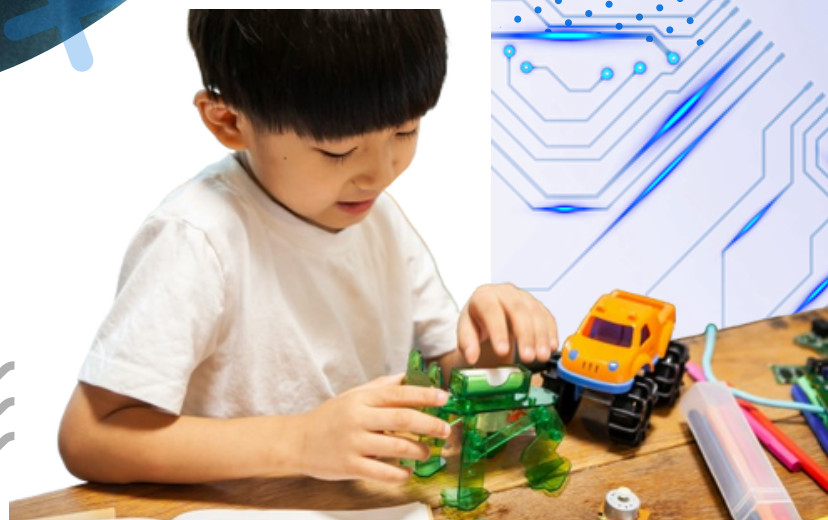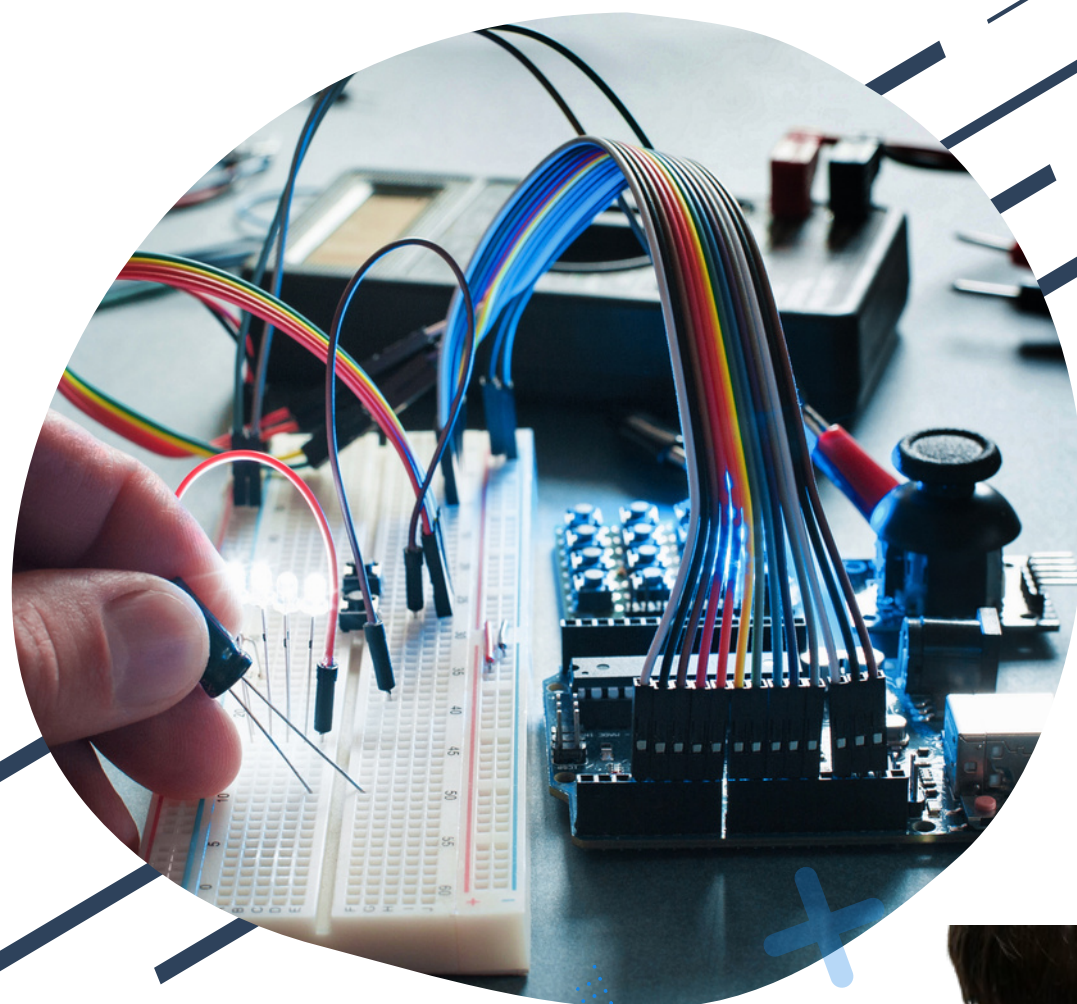
1.Introduction to Electronics

- Significance of electronics in everyday life
- Overview of electronic components & circuits

2.Basic Electrical Quantities

- Voltage, current, and resistance
- Ohm's Law & its applications

3.Circuit Analysis Techniques

- Series & parallel circuits
- Voltage & current division rules

4.Introduction to Digital Electronics

- Basics of digital signals & binary number system
- Logic gates & their truth tables

5.Introduction to Microcontrollers

- Understanding microcontrollers & their architecture
- Introduction to programming microcontrollers

Electronics Quiz 1

6.Sensors & Actuators

- Types of sensors & their applications
- Actuators: motors, relays & solenoids

7.Analog-to-Digital Conversion

- Basics of ADC and its types
- Interfacing sensors with microcontrollers using ADC

8.Digital-to-Analog Conversion

- Basics of DAC and its types
- Interfacing microcontrollers with actuators using DAC

9.Introduction to Wireless Communication

- Wireless communication technologies Bluetooth, Wi-Fi & GSM
- Applications of wireless commn in IoT & remote sensing

10.Electronics Prototyping & PCB Design

- Introduction to electronics prototyping using breadboards
- Basics of PCB design & fabrication

Electronics Quiz 2

11.Troubleshooting & Maintenance

- Techniques for troubleshooting electronic circuits
- Preventive maintenance of electronic systems

12.LED Blinking Circuit

- Make the LED blink at a regular interval
- Battery, resistor, and LED

13.Light-Dark Activated Switch

- Build a circuit with a Light Dependent Resistor
- Turns an LED on in the dark and off in the light

14.Water Level Indicator

- Circuit using water sensors
- Indicating the water level in a container using LEDs

15.Simple Alarm System

- Basic alarm system using a 555 timer IC
- Triggers a buzzer when a button is pressed

Electronics Quiz 3

16.Voltage Regulator

- voltage regulator IC (LM7805)
- Regulate the input voltage
- Provide a stable output voltage

17.Traffic Light Controller

- Simulates a traffic light system
- Timers to control the sequence of lights

18.Voltage Divider

- Using resistors to divide the input voltage
- Obtain a specific output voltage

19.Electric Door Bell

- Using a push-button switch, a buzzer & a power source

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20.Infrared (IR) Remote Tester
- IR receiver module to detect signals from an IR remote control
- LED lights up

26.Simulating Circuits
- Using Tinkercad's simulation feature
- Testing circuits virtually before building

32.Combining Electronics & 3D Design
- Integrating electronic components into 3D designs
- Design considerations for housing electronic circuits

Electronics Quiz 4

27.Introduction to Code Blocks
- Overview of Tinkercad's code blocks feature
- Introduction to block-based programming

33.LED Blinking Circuit
- LED that blinks on and off
- Different resistor values to adjust the blinking frequency

21.Introduction to Tinkercad
- Overview of Tinkercad interface
- Significance of Tinkercad in electronics prototyping

28.Basic Programming with Code Blocks
- Writing simple programs to control circuits
- Using loops, conditions & variables

34.Motorized Car
- Design a small car model using Tinkercad
- Incorporate a DC motor, make the car movable

22.Creating Basic Shapes
- Learning to create basic 3D shapes
- Understanding manipulation tools

23.Adding Electronic Components
- Exploring the Tinkercad electronic components library
- Adding components like resistors, LEDs, switches, etc

29.Advanced Circuit Design
- Creating more complex circuits
- Adding sensors, actuators & displays

35.Digital Clock
- 7-segment display for hours & mins
- Tinkercad's code blocks to program the clock

Electronics Quiz 7

24.Understanding Circuits
- Introduction to electronic circuits
- Basics of circuit design & connections

30.Animating Designs
- Adding animations to circuit designs
- Creating interactive elements

36.RGB LED Color Mixer
- RGB LED & potentiometers for each color
- Potentiometers to mix different colors

Electronics Quiz 6

25.Breadboard Layouts
- Understanding breadboard layouts
- Best practices for circuit organization

31.Designing 3D Models
- Introduction to Tinkercad's 3D design tools
- Creating custom 3D models for enclosures

37.Simon Game
- Using LEDs & push-buttons
- Different LED patterns for the player to repeat

Electronics Quiz 5

FINISH

COURSE CONTAINS

35+ Concepts

20+ Projects

8+ Quizzes

Certificate

Course completion Quiz

TMCL Certificate

'Programming is not just about solving problems; it's about creating elegant solutions that resonate with the simplicity of nature'.

-Albert Einstein

ENROLL NOW!