

NEWTON BOX BEGINNER CURRICULUM

Build Real - time Application Oriented Robots using STEM Concepts

Class
I - 16

Electrical Circuits & Electronic Concepts

Class
17 - 32

Building Real-time Application Robots
To enhance brain activity, logical reasoning,
analytical thinking and problem solving skills

Build Own Power Station

1

- ✓ Battery basics
- ✓ Energy recharge concept
- ✓ Power splitter function
- ✓ Basic circuits



Project Name:
Power Station

Create a military communication device using Morse code

6

- ✓ Morse code concept
- ✓ Understanding how to use Morse code
- ✓ Build a machine to decipher a hidden word using morse code



Project Name:
Military communication device

Build Basic Motion Robot using One-way Switch Concept

2

- ✓ Motor concepts
- ✓ Junction board
- ✓ One-way switch
- ✓ Multimeter usage
- ✓ Electrical circuits



Project Name:
One-way Switch Robot

Build a Water level indicator using Light Ring

7

- ✓ Understanding Logic Gates
- ✓ Water level measurement



Project Name:
Water level indicator

Build Advanced Motion Robot using Two- way Switch Concept

3

- ✓ Two-way switch
- ✓ Circuit debugging
- ✓ Electrical circuits



Project Name:
Two-way Switch Robot

Build a Smart House using multiple sensors

8

- ✓ Automated LED, Buzzer, etc.
- ✓ Multiple circuits



Project Name:
Smart House

Build Series & Parallel Circuits using LED

4

- ✓ LED concept
- ✓ Parallel circuit
- ✓ Series circuit



Project Name:
Build Series & Parallel Circuits using LED project

Build a hand following Motion Robot using multiple transistors

9

- ✓ Trigger out-of-the-box thinking
- ✓ A "Dog Pal" Robot



Project Name:
Hand following Motion

Learn Input Sensors, Transistor and Output Devices to build simple smart Robots

5

- ✓ IR, LDR & Touch Sensors
- ✓ Electromagnetic Spectrum concepts
- ✓ Buzzer, End switch & Reed switch
- ✓ Binary transistor logic
- ✓ Multiple circuits



Project Name:
Sensors project

Automatic Pencil Sharpener

10

- ✓ Activating analytical part of the brain to solve simple problems



Project Name:
Automatic Pencil Sharpener

NEWTON BOX INTERMEDIATE CURRICULUM



Build Fundamental Robots using Basic Programming and Electronic Concepts



**Class
I - 16**

**Basic Programming & Concepts
in Electronics**

**Class
17 - 32**

**Building Fundamental Robots to
enhance Programming Skills**

Learn about Microcontroller

1

- ✓ Arduino basics
- ✓ Analog and Digital concepts
- ✓ Programming controllers
- ✓ Digital read and write concepts



Project Name:
Microcontroller project

Build a Height Measuring Robot

6

- ✓ Integrating Ultrasonic sensors and OLED display to display measured height



Project Name:
Height Measuring Robot

Knight Rider Light

2

- ✓ Programming LED's
- ✓ Sequencing concept
- ✓ Loop concept
- ✓ Delay concept
- ✓ Electrical circuits



Project Name:
Knight Rider Light

Hacking TV Remote to control mood lights

7

- ✓ Understanding infrared communication mechanism



Project Name:
Hacking TV Remote

Advanced RGB Disco Light

3

- ✓ RGB concept
- ✓ Simple "if statement"
- ✓ Variable concept
- ✓ Electrical circuits



Project Name:
Advanced RGB Disco

Build a Social Distancing Cap using Multiple Sensors

8

- ✓ Detect anyone within 3 feet and alert to practice social distancing
- ✓ Automated LED, Buzzer & OLED



Project Name:
Social Distancing Cap

Build distance measuring Robot

4

- ✓ Ultrasonic concept
- ✓ Conditions and Operators
- ✓ Nested loops



Project Name:
Distance measuring Robot

Build a Rock, Paper, Scissor Robot

9

- ✓ Design and build a robot using servo motors and ultrasonic sensor to play a game



Project Name:
Build a Rock, Paper, Scissor Robot

Build a Smart Dustbin

5

- ✓ Servo Motor concept
- ✓ Serial Communication and Monitoring
- ✓ Obstructing object detection
- ✓ Binary logic



Project Name:
Smart Dustbin

Build a Remote Controlled Advanced Motion Robot to move in all direction

10

- ✓ Infrared communication
- ✓ Operators, Conditions & Variables



Project Name:
Remote Controlled Robot

NEWTON BOX ADVANCED CURRICULUM

Programme Debugging and Building Real-time Application Oriented Robots using STEM Concepts

Class
1 - 16

Programme Debugging & Extensive STEM Robotics Concepts

Class
17 - 32

Building Real - time Application Oriented Robots
To enhance Programming Skills using STEM Concepts and problem solving skills

Programme debugging, Reconfiguring Microcontroller in Advanced Circuits

1

- ✓ Reconfiguring Microcontroller for multiple components Conditional "if statement" concepts



Project Name:
Microcontroller project

Edge avoiding Robot

5

- ✓ Build a motion Robot that detects edges and avoid fall from height



Project Name:
Edge avoiding Robot

Hand gesture moving Lift

2

- ✓ Multiple sensors/ Output actuation
- ✓ Two way IR sensor control logic
- ✓ Analog read and write
- ✓ Pulse Width Modulation concept



Project Name:
Hand gesture moving Lift

Self driving Car Robot

6

- ✓ Build a Robot to move in all directions without any collision



Project Name:
Self driving Car Robot

Build a line following Robot

3

- ✓ Build a motion Robot that follows a specific path



Project Name:
Line following Robot

Firefighting Robot

7

- ✓ Flame sensor concept
- ✓ Understanding how to use Flame sensors
- ✓ Submersible pump & electrical relay functions
- ✓ Build a Robot to detect flame and activate a fire extinguisher



Project Name:
Firefighting Robot

Light following Robot

4

- ✓ Build a motion Robot that follows the direction of light



Project Name:
Light following Robot

Smart Plant Watering

8

- ✓ Trigger out-of-the-box thinking
- ✓ A "Plant Pal" Robot



Project Name:
Smart Plant Watering project