



## Training program on Lego EV3.

### Introduction to Robotics:

- What is Robot?
- Why robotics in Education?
- How Robotics help to understand Subjects

### EV3 Hardware:

- Lego MINDSTROMS.
- Hardware and software kit.
- Exploring the LEGO EV3 Hardware kit.
- Motors and different components.
- How Motor works.



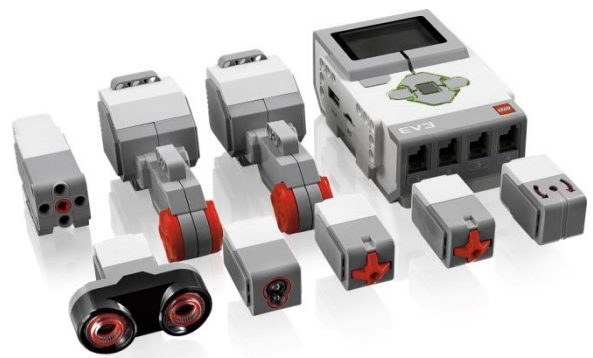
### EV3 Software:

- Introduction to EV3 software.
- Blocks explanation.
- Creation of my block.
- Programming our own block.
- Optimizing techniques
- Wired and wireless programming using Bluetooth.



### Sensors:

- Sensor concept.
- Understanding the sensors.
- Line sensor
- Colour sensor
- Ultrasonic sensor
- Touch sensor





- IT sensor
- Applications of each sensor.

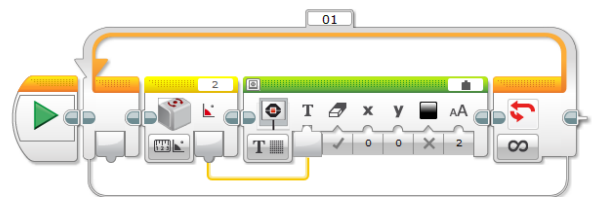
## PRACTICALS:

Unit Name	Main Topics
1. Moving Straight	Motors, Sequences of Commands, Block Settings, Downloading and Running Programs, Move Steering Block
2. Turning	Turning, Types of Turns, Move Steering vs. Move Tank Block
3. Move Until Touch	Sensors, Wait For Block, Touch Sensor, Move Until Behaviors
4. Move Until Near	Ultrasonic Sensor, Thresholds
5. Turn for Angle	Gyro Sensor, Compensating for Sensor Error
6. Move until Color	Color Sensor
7. Loops	Loops, Patterns of Behavior
8. Switches	Switches, Conditional Reasoning
9. Switch-Loops	Obstacle Detection Behavior, Repeated Decisions Pattern
10. Line Follower (Mini-Unit)	Line Following (a Repeated Decisions Pattern Behavior)
11. Final Challenge	Cumulative Application of Skills and Knowledge

- Learning science and maths concepts using EV3 robots.

## DECISION MAKING

- Data logging Investigation
- Loops
- Switches
- Repeated Decisions: Discrete
- Repeated Decisions: Continuous
- Obstacle detection and Line following



## PLANNING and TROUBLESHOOTING

- Troubleshooting for student understanding



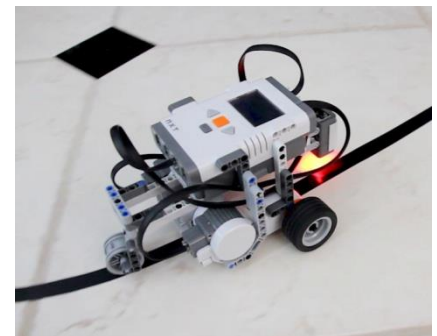
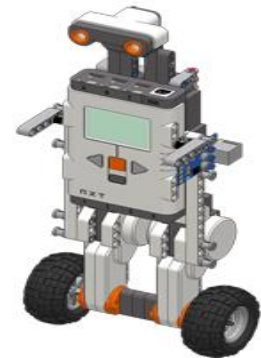
- Planning, Pseudo code, and Process
- Search and Rescue Challenge

### DATA FLOW and LOGIC

- Data Flow
- Displaying Data

### Types of robots covered:

1. Line following robot.
2. Obstacle avoiding robot.
3. Touch me not robot.
4. Colour scanning robot.
5. Distance measurement robot.
6. Bluetooth Controlled Robot.
7. IT controlled Robot.
8. Geometry Robot.
9. Pick and place robot.
10. Self balancing robot.



### Schedule:

Twice a week

Saturday : \_\_\_\_ PM to \_\_\_\_ PM

Sunday : \_\_\_\_ PM to \_\_\_\_ PM

Course Duration: 5 months

### Take away from the course:

- Presentations (PPTs)
- Documents on steps to build different kinds of robots
- Document of Complete course material.



## Competitions:

On completion on each module assignments are assigned.

On successful completion of assignments competitions are conducted

Awards will be given based on following categories

- Best individual performer
- Best team
- Best creative robot
- Best program

