

Basic Robotics Syllabus

Duration: 1 week, 10 hours, 2 hours a day

Session 1: Introduction to Robotics (Presentation)-Compulsory

Robotics: History, Concepts, principles and applications of Robots, different types of Robots, degrees of freedom, Kinematics and Inverse Kinematics (definitions), Robot classification, Robotic vision, controlling robot movements.

❖ Introduction to Robotics Hardware:

- a)** Sensors: IR sensors, Proximity Sensor, Ultrasonic Sensor, White line sensor, Temperature Sensor, Touch sensor, Tilt Sensor, Accelerometer, Gyroscopic Sensor etc.
- b)** Actuators: DC motor, Servo motor, Stepper Motor, Motor driver ICs, Pulse Width Modulation and Gripper.

1. Level 1 robot

- i. To assemble two Geared DC Motors & wheels to the chassis of the Robot
- ii. Making of remote using DPDT switches & battery clips.
- iii. Making Wired connection between Chassis & remote.
- iv. Function: Control forward, Backward, Left, Right Motions.

2. Level 2 Robot

- a.** Assembling same as level 1 Robot.
- b.** This is wireless Robot. We have to put RF 315 Transmitter Circuitry on Remote & Receiver circuitry on the Chassis of the Robot.
- c.** Soldering of the necessary Components on PCB for making Transmitter & receiver Circuit.
- d.** Function: Control forward, Backward, Left, Right Motions

3. Visual programming on Spark V Robot.

- i. Presentation on Introduction to Spark V robot.
- ii. Introduction to Microsoft Robotics Developer Studio Software.
- iii. Introduction to Visual programming Language.
- iv. Basic tutorials in VPL e.g. Addition, Subtraction, Counter etc.
- v. **Tutorials to perform on spark V robot**
 - a.** Buzzer On/Off
 - b.** Commands for Driving Motors
 - c.** White line Follower
 - d.** Robo Joystick
 - e.** Obstacle avoidance.