**Robotics (Arduino) Programming**

**Semester - 1**

| **Session Nos.** | **Concept / Component** | **Learning Target** | **Project / Real Life Application** |
| --- | --- | --- | --- |
| 1 | Introduction to Arduino | Learning the concepts of Arduino | Introduction |
| 2 | LED | Learning about breadboard and how different  components can be connected to it | LED Blinker |
| 3 | Variables and Data type | Learning about variables and datatypes in C++ |  |
| 4 | Conditional  Statements | Learning if and if else..  statements | Door Bell |
| 5 | using C++ Syntax |  |
| 6 | Switch  Statement | Learning Switch case Statement | (Based  on user input) |
| 7 | Learning how switch statements can be used for  controlling LED(s) | Car Parking Management System |
| 8 | Seven  Segment display (CC) | Learning about 7 segment display and programming  it |  |
| 9 | Programming Seven Segment to display any single  digit number | Digit Counter |
| 10 | Photoresistor | Learn how to program Photoresistor along with  Arduino for creating automatic street light | Automatic street Light |
| 11 | For Loop | Learning For Loop coding | Fading LED |
| 12 | Quiz | Revision and Test |  |
|  |  |  | **Projects = 6** |

**Semester - 2**

| **Session Nos.** | **Concept / Component** | **Learning Target** | **Project / Real Life Application** |
| --- | --- | --- | --- |
| 1 | Temperature and Humidity | Learn how to monitor temperature and humidity  using DHT11 sensor | Weather Monitoring |
| 2 | IR Sensor | Learning how to program IR sensor for | Door Alarm System |
| 3 | Ultrasonic Sensor | Learning how to program and use Ultrasonic  Sensor | Social Distancing |
| 4 | Assembling Robot | Learning how to build a Robot | Build your own Bot |
| 5 | Coding for  Bot Movements | Learning  how to make your robot move forward, backward | Robot in  Motion |
| 6 |
| 7 | Line Follower Bot | Learning how program a bot to track a particular  path | Line Follower Bot |
| 8 |
| 9 | Bluetooth Module | Learning how to program and use Bluetooth | Remote  Controlled Car |
| 10 | Bluetooth Module | Learning how to make remote controlled Robot |  |
| 11 | Ultrasonic Sensor | Learning how to make Anti Collision Robot | Anti-Collision Bot |
| 12 | Quiz | Revision and Test |  |
|  |  |  | **Projects = 7** |

| **Sessions** | **Concept / Component** | **Learning Target** | **Project /**  **Real life Application** |
| --- | --- | --- | --- |
| Session 13 | Servo Motor | Learn how to program Servo Motor |  |
| Session 14 | Servo and Ultrasonic Sensor | Learn how to navigate the robot to move in a path with low visibility | Mining Robot |
| Session 15 |
| Session 16 |
| Session 17 | Bluetooth Module and Seven Segment Display | Learn how to integrate Bluetooth and seven segment module | Smart Ordering System |
| Session 18 |
|  |  |  | **Projects = 3** |