

| Session | Topic | Learning Outcome |
|---------|--------------------------------------|---|
| 1 | Introduction to Arduino | Understand Arduino boards, install IDE, run first blink program |
| 2 | Digital Input and Output | Use push button as input and LED as output |
| 3 | Variables and Data Types | Learn int, float, char, boolean; use Serial Monitor |
| 4 | Conditional Statements | Use if-else to control devices based on conditions |
| 5 | Loops – for, while | Practice repetitive tasks with for and while loops |
| 6 | Analog Input | Read values from potentiometer using analogRead |
| 7 | PWM and Analog Output | Control LED brightness with analogWrite |
| 8 | Using Buzzer | Generate sound alerts with buzzer |
| 9 | Servo Motor Basics | Control servo angle using Arduino |
| 10 | Serial Communication | Send and receive data using Serial Monitor |
| 11 | Introduction to Arduino IoT Cloud | Understand IoT, setup account, connect ESP board |
| 12 | First Cloud Device | Create a Thing and test connectivity |
| 13 | Cloud LED Control | Turn LED ON/OFF from IoT Cloud dashboard |
| 14 | Cloud Switch Input | Send button press status to IoT Cloud |
| 15 | Cloud Buzzer Control | Control buzzer remotely from cloud |
| 16 | Servo Motor with Cloud | Control servo angle via IoT Cloud |
| 17 | DHT Sensor Data | Monitor temperature and humidity on IoT Cloud |
| 18 | Soil Moisture Sensor | Measure and send soil moisture data |
| 19 | IR Sensor Monitoring | Detect obstacle/motion and send data |
| 20 | Cloud Automation Rules | Create IoT Cloud automation (LED ON when soil dry) |
| 21 | IoT Fan Control | Fan/LED control based on temperature |
| 22 | IoT Plant Watering System | Automate watering using moisture sensor and pump |
| 23 | IoT Motion Alarm | Use IR sensor and buzzer for alerts |
| 24 | IoT Smart Door Lock | Control servo as smart door lock |
| 25 | IoT Light Automation | Use LDR sensor + cloud switch for lights |
| 26 | IoT Security Alarm | Combine IR, buzzer, cloud alerts |
| 27 | IoT Weather Station | Display live temperature and humidity on dashboard |
| 28 | IoT Home Automation | Control multiple devices from dashboard |
| 29 | IoT Smart Parking System | Use IR + servo for smart parking gate |
| 30 | Final Project – Smart Home Dashboard | Integrate all sensors and actuators into single cloud dashboard |