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| **Session 1**  **(beginning with electronics)** | 1. Solderless breadboard circuit structure. 2. Parallel circuit vs. series circuit. 3. LED meaning and structure. 4. Resistor structure. 5. Ohm, volt, amp. 6. Press button structure. 7. How to read the diagrams of circuits. 8. 1st project: traffic light manually: 9. Connection 1. 10. Connection 2. |
| **Session 2**  **(Arduino)** | 1. About Arduino. 2. Arduino Uno structure. 3. Application code vs. Firmware. 4. Arduino platform types. 5. Jumper wires types. 6. Arduino IDE. 7. Examples codes. 8. C++ language basics (int, float, char, void setup, void loop, high, low,….., etc.). 9. 2nd project: traffic light automatically: 10. Traffic light connection with Arduino. 11. First simple code (Blink code). 12. Second code (Macro definition, delay, for loop). |
| **Session 3**  **(More details)** | 1. Digital signal. 2. Digital sensors. 3. LDR sensor structure. 4. Potentiometer. 5. digitalRead (coding). 6. Serials meaning and types (coding). 7. Small project 1: 8. LDR digital sensor connection. 9. LDR sensor digital code. 10. Analog signal. 11. Analog sensors. 12. analogRead (coding) 13. Small project 2: 14. LDR analog sensor connection. 15. LDR sensor analog code. 16. Digital to analog. 17. Analog to digital. 18. Pulse-width modulate (PWM). 19. analogRead (coding) 20. Small project 3: LDR and LED: 21. LDR connection with LED with Arduino. 22. Code. 23. Small project 4 (Pulse-width modulate (PWM)): 24. LED analog. 25. Code. 26. Bluetooth sensor Module. 27. If .. if else loop (coding) 28. Small project 5: Bluetooth: 29. Bluetooth connection with LED with Arduino. 30. Code. 31. “Arduino Bluetooth control” app. |
| **Session 4** | 1. Shields meaning and its importance. 2. Motor shield using and its structure. 3. DC motor (wheels). 4. IR Sensor Module structure. 5. Small project 6: IR sensor: 6. IR connection with Arduino. 7. Code. 8. Libraries importance (coding). 9. AF\_DCMotor (coding). 10. How to do function (coding). 11. 3rd project: Line follower robot: 12. Motor shield connection with Arduino. 13. DC motors connection with motor shield. 14. IR sensor connection. 15. Code. 16. 4th project: Bluetooth car: 17. Bluetooth connection. 18. Code. 19. b. “Dabble – Bluetooth controller for Arduino & ESP32” app. |
| **Session 5** | 1. Types of motors. 2. Servo motor structure. 3. Small project 7: 0° rotation, 90° rotation, 180° rotation: 4. Servo motor connection with Arduino. 5. “Servo.h” library. 6. Code 1. 7. Code 2. 8. Ultrasonic module structure. 9. Small project 8: Ultrasonic: 10. Ultrasonic connection with Arduino. 11. Code 1. 12. Code 2. 13. 5th project: safe automatic car: 14. Servo motor connection with motor shield. 15. Code. |