Embedded and IoT Course

(Estimated Duration of the course is 3-4 weeks)

Embedded Systems

- C Programming
    - Tokens, operators, functions, arrays, conditions and loop, (bit manipulation).
- Transistor, Diodes and Semiconductors.
    - Building up the basic knowledge of how electronics work. Gates (Flip-Flops).
- Microprocessors and microcontrollers
    - Difference and applications
- Arduino IDE setup, blinking
    - Setup the IDE and get familiar with the hardware, and run some basic codes.
- AM, PWM, PPM
    - Introduction to different types of Modulation and how data is transferred.
- Fading, servo and other PWM applications
    - Various PWM applications.
- communication protocols
    - UART, I2C and SPI, and their implementation and application.
- Sensors and Displays
    - Interfacing different sensors and displays with the Microcontroller.
- (Control Systems)
    - PID control.
- **Minor Project on Embedded Systems**

Internet of Things

- Introduction to IoT, NodeMcu setup
    - Theoretical knowledge of IoT
- Networking basics
    - Basic knowledge of Networking essential for IoT
- WiFi class
    - Member functions and data members and their uses.
- Connecting WiFi and RSSI, Webpage blink
    - LAN setup and blinking onboard LED from a webpage.
- Blynk
    - Introduction to Blynk platform and using different features.
- Adafruit and IFTTT
    - Introduction and using MQTT protocols with various other platforms.
- Firebase
    - Introduction to Firebase platform and using different features.
- (AWS)
- **Minor Project on IoT**

Major Project on Embedded and IoT

Component List

- Arduino Uno (with cable)
- NodeMcu (with cable)
- LED x5
- Resistors (a pack)
- Transistors (BC547)x2
- Potentio-meter
- Push buttons x5
- Bread Board (medium)
- Jumper Wires (15cm, each set 10pcs)
- Relay Module (4 channel)
- Sensors and Displays
    - IR x2
    - Ultrasonic x2
    - DHT 11
    - LCD
    - MPU 6050