



AICTE APPROVED

SIRINTEL TECHNOLOGIES PRIVATE LIMITED

Address: 2696, Tarvi's, 2nd floor, Mama's Joint Road, 2nd Main 3rd Cross Rd, above Peter England showroom, MCC B Block, Davanagere, Karnataka 577004



अखिल भारतीय तकनीकी शिक्षा परिषद्
All India Council for Technical Education



15-Week Embedded Systems and IoT Course Syllabus

Week 1: Introduction to Embedded Systems and IoT

- Overview of Embedded Systems and IoT.
- Introduction to Arduino Uno, ESP8266, and ESP32S.
- Basics of Microcontrollers and their Role in IoT.
- Setting Up the Development Environment: Arduino IDE and Libraries.

Week 2: Getting Started with Arduino Uno

- Introduction to Arduino Uno: Features and Pin Configuration.
- Writing and Uploading Basic Sketches.
- Digital and Analog Input/Output on Arduino.
- LED Blinking and Button Control.

Week 3: Sensors and Actuators with Arduino

- Introduction to Sensors: PIR, IR, Smoke, Flame, DHT11, LDR.
- Interfacing Sensors with Arduino.
- Reading Sensor Data and Displaying on Serial Monitor.
- Controlling Actuators: Relays, Motors, and LEDs.

Week 4: Introduction to ESP8266 and ESP32S

- Overview of ESP8266 and ESP32S: Features and Applications.
- Setting Up ESP8266/ESP32S in Arduino IDE.
- Basic Wi-Fi Connectivity and Networking.
- Writing and Uploading Sketches to ESP8266/ESP32S.

Week 5: IoT with ESP8266 and ESP32S

- Understanding IoT Protocols: HTTP, MQTT.
- Connecting ESP8266/ESP32S to the Internet.



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- Sending and Receiving Data over Wi-Fi.
- Basic IoT Project: Remote Monitoring using ESP8266/ESP32S.

Week 6: Introduction to Blynk Application

- Overview of Blynk: Features and Cloud Platform.
- Creating a Blynk Account and Setting Up the Dashboard.
- Linking Arduino/ESP8266/ESP32S with Blynk App.
- Sending and Receiving Data via Blynk.

Week 7: Advanced Blynk Applications

- Implementing Virtual Pins in Blynk.
- Real-Time Monitoring and Control via Blynk App.
- IoT Project: Home Automation System using Blynk and ESP32S.
- Integrating Multiple Sensors and Actuators with Blynk.

Week 8: Working with RFID and Security Systems

- Introduction to RFID Technology: How It Works.
- Interfacing RFID with Arduino and ESP8266.
- Writing Code to Read RFID Tags.
- IoT Project: Implementing RFID-Based Security System.

Week 9: PIR and IR Sensors in IoT Projects

- Understanding PIR and IR Sensors: Applications and Interfacing.
- Writing Code to Detect Motion and Infrared Signals.
- IoT Project: Motion Detection and Alert System.
- Integrating PIR/IR Sensors with Blynk for Remote Monitoring.

Week 10: Smoke and Flame Sensors

- Introduction to Smoke and Flame Sensors.



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- Interfacing Smoke and Flame Sensors with Arduino/ESP8266.
- Writing Code to Detect Smoke and Fire.
- IoT Project: Fire Detection and Alarm System.

Week 11: Environmental Monitoring with DHT11 and LDR

- Overview of DHT11 (Temperature and Humidity) and LDR (Light Sensor).
- Interfacing DHT11 and LDR with Arduino/ESP32S.
- Writing Code to Monitor Environmental Conditions.
- IoT Project: Weather Station with Remote Data Logging.

Week 12: Advanced IoT Communication

- Introduction to Advanced IoT Communication Protocols.
- Working with MQTT for IoT Applications.
- Implementing Real-Time Data Transmission using MQTT.
- IoT Project: Building a Real-Time Data Monitoring System.

Week 13: Power Management in Embedded Systems

- Introduction to Power Management Techniques.
- Optimizing Power Consumption for IoT Devices.
- Sleep Modes and Power Optimization for Arduino and ESP32S.
- Implementing Low-Power IoT Projects.

Week 14: Integrating Multiple IoT Systems

- Combining Multiple Sensors and Actuators in One System.
- Writing Complex Code to Handle Multiple Inputs/Outputs.
- IoT Project: Comprehensive Home Automation System.
- Testing and Debugging Complex IoT Systems.

Week 15: Final Project Development and Presentation



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- Selecting a Final IoT Project Based on Previous Weeks' Learnings.
- Project Development: Writing Code, Testing, and Integration.
- Preparing Project Documentation and Presentation.
- Final Demonstration and Evaluation of Projects.



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