

## "Security issues and Challenges of Internet of Things (IoT)"

### Day 1:

**10:00 AM to 1:00 PM :- Theory Session on TIVA C series launchpad**

**Objective:** Learning of Arm-cortexM4F Architecture.

- ❖ Introduction to ARM Boards and features of ARM.
- ❖ Introduction to Tiva C Series Launchpad.
- ❖ Introduction to Code composer studio and Energia IDE

**2:00 PM to 5:00 PM:- Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective:** Understanding the configuration of GPIO pins and power consumption reduction using hibernation in TIVA.

- ❖ Hibernation and Wakeup on an RTC Interrupt.
- ❖ Interfacing Potentiometer with TIVA GPIO.
- ❖ Serial communication using UART peripheral

### Day 2:

**10:00 AM to 1:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective:** Understanding the Internet of Things Opportunities & Challenges and controlling on board LED using smart phone .

- ❖ TI Internet of Things Overview.
  - Security issues and Application Areas for the Internet of Things.
  - Featured IoT Products from TI.
  - Cloud Solutions supporting TI solutions.
  - Challenges in the Internet of Things
- ❖ Controlling on board Led using smart phone.
- ❖ Implementing chatting application between MSP430 and smart phone using TELNET app.

**02:00 PM to 5:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective :**Interfacing , reading and displaying the external sensor readings.

- ❖ Photoresistor (Light Sensor).
- ❖ Spin the Motor (Transistor).
- ❖ Temperature (Thermistor and Temp Sensor).
- ❖ 7 Segment Display (Digital Display).
- ❖ Playing Music - (Buzzer).
- ❖ Control the Electric - (Relays).
- ❖ Display- (4-Digital Display).
- ❖ Potentiometer - (Rotary Angle Sensor).
- ❖ Sensing the Light - (Light Sensor).
- ❖ Hearing - (Sound Sensor).
- ❖ Is anybody there- (PIR Sensor).
- ❖ Taking care of your plants- (Moisture Sensor).
- ❖ Sensing the Distance - (Ultrasonic Ranger Sensor).
- ❖ Feeling the Environments - (Temperature Humidity Sensor).
- ❖ Generating Moisture call using Temboo Cloud Service.

**Day 3:**

**10:00 AM to 1:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective:** Understanding the Ecosystem of cloud partners to enable easy integration

- ❖ Discussing Pubnub and Freeboard Creating account on PubNub and Freeboard .
- ❖ Publishing Sensor Readings to PUBNUB.

**02:00 PM to 5:00 PM:-Hands-On Session on TIVA C series launchpad using Energia**

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**software / Code composer studio**

**Objective:** Understanding the concept of sensor data posting to cloud using IoT.

- ❖ Subscribing a Sensor Readings from PUBNUB.
- ❖ Visualization of Sensor Readings using free-Board.
- ❖ Controlling On board LED through BLYNK application using CC3200 launchpad using Energia.

#### **Day 4:**

**10:00 AM to 1:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective:** Understanding the Encryption and Decryption techniques in AES module

- ❖ AES example on encryption/decryption

Introduction to CBC (Cipher block chaining) mode

- ❖ Encryption operation using AES128 module in CBC (Cipher block chaining) mode
- ❖ Decryption operation using AES128 module in CBC mode

Introduction to CCM mode

- ❖ Encryption operation using AES128 module in CCM mode

**02:00 PM to 5:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective:** Understanding the Encryption and Decryption techniques in AES module

- ❖ Decryption operation using AES128 module in CCM mode
- ❖ Introduction to EBC (Electronic Codebook) mode
- ❖ Encryption operation using AES128 module in EBC (Electronic Codebook) mode
- ❖ Decryption operation using AES128 module in EBC mode

#### **Day 5:**

**10:00 AM to 1:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective: Understanding the Encryption and Decryption techniques in AES module**

- ❖ Introduction to Galois/Counter Mode (GCM) mode
- ❖ Encryption operation using AES128 module in Galois/Counter Mode (GCM) mode
- ❖ Decryption operation using AES128 module in Galois/Counter Mode (GCM) mode

**02:00 PM to 5:00 PM:-Hands-On Session on TIVA C series launchpad using Energia software / Code composer studio**

**Objective: Understanding the Encryption and Decryption techniques in AES module**

- ❖ Encryption operation using AES module with triple DES in CBC mode
- ❖ Decryption operation using AES module with triple DES in CBC mode