**Internet of Things (IoT)**

**MICT-5306**

**Lecture-01**

1. What is IoT? What are the benefits of IOT?
2. Benefits of IoT?
3. Explain WSN. How to convert it to IOT?
4. Difference between IoT vs. M2M using a table?
5. Explain main Challenges in IoT.
6. Global IoT Market Share.
7. Draw the Industrial IoT Structure?
8. Difference between TCP/IP vs IOT model. Note the challenge between them.
9. Draw Iot Network Architecture.

**Lecture-02**

1. What is the IoT Ecosystem?
2. What is IoT Framework?
3. IoT Network Architecture
4. Explain Core Components of IoT?
5. What are the communication criteria to compare Iot access technologies e.g Wifi,BLE,Thread,Sub-GHz, Zigbee,LoRa using all communication criteria.
6. How many ways can the sensors be clustered? Explain with examples and figures?
7. Explain the IoT Gateway.

**Lecture-03**

1. What are the fundamental building blocks of IoT?
2. Write the sensor type with an example.
3. Write the name of the smartphone's sensors.
4. What are the classifications of actuators?
5. What are the classifications of actuators based on the type of energy?
6. What are smart objects in IoT?
7. What are the characteristics of smart objects?
8. What are the current trends in smart objects?

**Lecture-04**

1. What is Arduino and how is it useful in IOT projects?
2. What are the different types of Arduino boards, and when should you use each one?
3. What is the significance of the pin diagram of an Arduino UNO and draw the pin diagram?
4. What is the Arduino IDE, and why is it important for programming Arduino?
5. Describe the steps to upload a simple LED blink program to Arduino using the IDE.
6. How can you use an Arduino board to read the temperature from a sensor and display it?
7. How would you write a program to blink the built-in LED on an Arduino UNO periodically, and what is the role of the delay() function in this?

**Lecture-05**

1. Explain the role of the section in Arduino programming where you initialize configurations and another section where tasks are repeated continuously. How do these sections work together to create a blinking LED program?
2. How would you design a system where pressing a switch turns an LED on and releasing it turns the LED off? Explain the steps involved in detecting the switch's state and controlling the LED accordingly.
3. What operators are available in Arduino programming, and how do they help in performing mathematical or logical operations within your program?
4. What is the role of the built-in Arduino function library, and how does it simplify programming tasks?
5. Can you explain how to use the digitalWrite() and digitalRead() functions in a simple LED blinking program?
6. Modify the binary counter program with 3 LEDs to count in reverse. Instead of starting from 0, it should count down from 7 to 0. How would you achieve this?

**Lecture-08**

1. What does UART stand for? write with a description.
2. What type of communication does UART support?
3. What are the problems with the data line-based synchronization scheme in UART? What are used to solve these problems?
4. What is UART communication?
5. Draw the data frame structure in UART.
6. Write the steps of the UART communication mechanism.
7. What is the purpose of parity in UART communication?
8. What are the two types of parity used in UART?
9. How many data lines are used in UART communication? Name them.
10. List two advantages and two disadvantages of UART communication.

Lecture-14, 23, 24

1. Write down ZigBee Applications.
2. What is ZigBee Alliance?
3. Which types of topologies that ZigBee supports.
4. Write down the Key Features of ZigBee PHY.
5. Which type of IoT Data Analytics? Explain.
6. IoT Data Analytics - Challenges?
7. Explain different types of Types of ML?
8. What is Big Data? Characteristics of Big Data
9. Key Features of Edge Streaming Analytics?
10. Write some Common Security Attacks?
11. What is Hash Function and Message authentication?