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***CSL7401 IoT Lab***

**L-T-P-Cr: 0-0-3-1**

**Pre-requisites:** Basic knowledge of Linux commands, C/Java, Python, Database and Computer Networks

**Objectives:**

* To familiarize with different types of sensors/actuators and development board used in Internet of Things applications
* To learn device level programming using C and Python
* To implement Internet of Things protocols

**Course Outcomes:**

At the end of the course, a student should:

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| **S.NO** | **Outcomes** | **Mapping to PO** |
| CO-1 | Be able to code solutions to problems in Python | PO3, PO4 |
| CO-2 | Be able to interface a database with Python | PO3, PO4 |
| CO-3 | Be able to work with different types sensors/actuators and development boards | PO1, PO3, PO4 |
| CO-4 | Be able to implement IoT protocols | PO1, PO2, PO3, PO4 |
| CO-5 | Prepare a report in prescribed format of the lab experiments carried out. | PO8 |

**List of Experiments:**

1. Study and configure the development board
2. Write a program to establish database connectivity using Python and perform basic query operations
3. Write a program to implement client-server interaction
4. Study the working of different types of sensors using IoT Training Kit
5. Write a program to prepare a humidity data logger and access the logs over Wifi/Ethernet
6. Write a program to collect temperature data and turn on/off actuator like servo motor, led etc based on some fixed threshold value of the temperature. The collected temperature data should be stored in the database and displayed to the user upon request.
7. Allocation of mini projects
8. Write a program to display a warning message if fire is detected using flame sensor
9. Write a program to control led lights using motion sensor
10. Write a program to access, capture and store the image feed from serial camera
11. Study and Implement MQTT Protocol
12. Study the functionalities and working of drones
13. Write a program to collect sensor data using drone and send the data to the users using MQTT protocol
14. Study the functionalities and working of a mobile robot