

## Lab Assignment

**Subject Name: CLOUD COMPUTING & IOT**

**Subject Code: PCCCS692**

**Stream: CSE (AIML), CSBS**

**Academic Year: 2024-2025**

### Laboratory Learning Outcome:

**LO1:** Understand cloud computing models and security principles.

**LO2:** Deploy AWS services, optimize resource management techniques.

**LO3:** Implement the interface IoT sensors with Arduino/Raspberry Pi.

**LO4:** Design of IoT-based smart system integrating real-time monitoring, and analytics.

Serial No.	Experiments / Problem Statement	Module	LO
<b>Day 1</b>			
Assignment 1	Introduction to Arduino platform and programming	4	3
Assignment 2	Creating Public Cloud Account in AWS, GCP, Azure, OCI (Free tier) and do a comparative analysis of the similar services.	1	1
<b>Day 2</b>			
Assignment 1	Interface a DHT11/DHT22 sensor to read temperature and humidity.	4	3
Assignment 2	Creating one AWS EC2 instance (Free tier) and login into it with Key.	3	2
<b>Day 3</b>			
Assignment 1	Simple program digital read/write using LED and Switch -Analog read/write using sensor and actuators.	4	3
Assignment 2	Configuring the security policies of that AWS EC2 instance and login to that server using SSH with password.	3	2
<b>Day 4</b>			
Assignment 1	Introduction to Raspberry PI platform and Python Programming	4	3
Assignment 2	Host your own web-based project to that AWS EC2 instance.	2	2
<b>Day 5</b>			
Assignment 1	Upload data from environmental sensor to cloud server.	4	3
Assignment 2	Host and connect your project database using AWS RDS.	2	2
<b>Day 6</b>			
Assignment 1	Introduction to MQTT/ CoAP and sending sensor data to cloud using Raspberry-Pi/Arduino	4	3

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✓ Assignment 2	Store and access the required information to and from AWS S3 buckets.	2	2
<b>Day 7</b>			
Assignment 1	Control devices like LEDs or relays using a mobile app or web interface via Arduino.	4	3
✓ Assignment 2	Create Image from Snapshots of the instance and create another server with that image in AWS.		
<b>Day 8</b>			
Assignment 1	Interface a heart rate sensor (e.g., Pulse Sensor) with Arduino and upload real-time health data to a cloud platform.	5	4
✓ Assignment 2	Live VM migration in different AWS accounts of the live projects.	1	2
<b>Day 9</b>			
Assignment 1	Install, configure XMPP server and deployed an application on Raspberry Pi/ Arduino.	5	4
✓ Assignment 2	Building machine learning models with AWS SageMaker.	2	2
<b>Day 10</b>			
Assignment 1	Write client applications to get services from the server application.	4	4
Assignment 2	Install and configure Aneka 5.0 with master node and worker nodes. Run Inbuilt Application top of Private Aneka Cluster.	1	1

### List of Mini Projects:

1. Serverless IoT Data Processing Using AWS Lambda and S3
2. Deploying a Scalable Web App on AWS with Load Balancing
3. Building a Cloud-based IoT Dashboard with Firebase and MQTT
4. Smart Home Automation with Raspberry Pi and AWS IoT Core