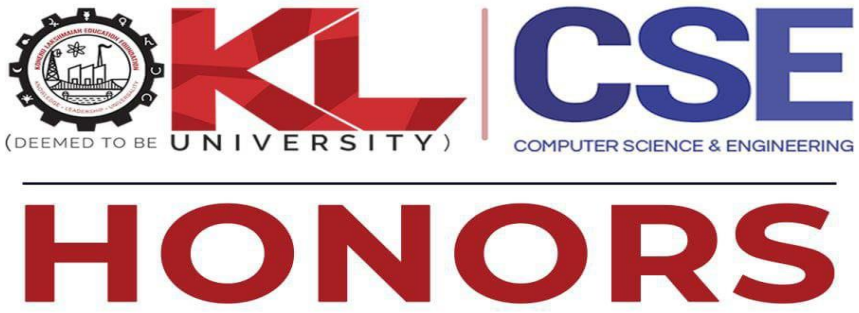
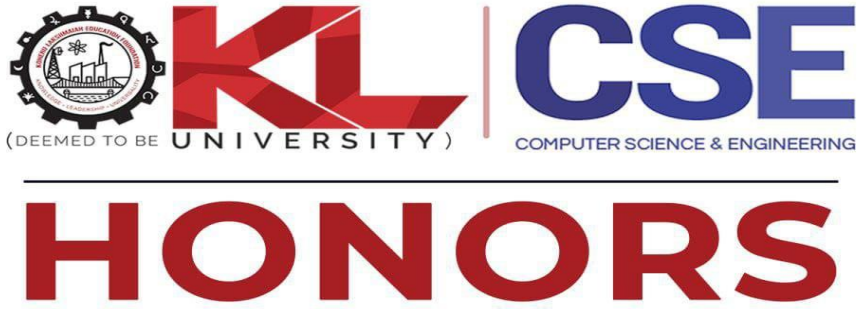


HONORS

LAB WORKBOOK

22SDC105R – CLOUD DEVOPS

Team DevOps
K L UNIVERSITY | CLOUD DEVOPS



LABORATORY WORKBOOK

STUDENT NAME	
REG. NO	
YEAR	
SEMESTER	
SECTION	
FACULTY	

Table of Contents

Organization of the Student Lab Workbook

The laboratory framework includes a creative element but shifts the time-intensive aspects outside of the Two-Hour closed laboratory period. Within this structure, each laboratory includes two parts: Prelab and In-lab.

a. Pre-Lab

The Prelab exercise is a homework assignment that links the lecture with the laboratory period - typically takes 2 hours to complete. The goal is to synthesize the information they learn in lecture with material from their textbook to produce a working piece of software. Prelab Students attending a two-hour closed laboratory are expected to make a good-faith effort to complete the Prelab exercise before coming to the lab. Their work need not be perfect, but their effort must be real (roughly 80 percent correct).

b. In-Lab

The In-lab section takes place during the actual laboratory period. The First hour of the laboratory period can be used to resolve any problems the students might have experienced in completing the Prelab exercises. The intent is to give constructive feedback so that students leave the lab with working Prelab software - a significant accomplishment on their part. During the second hour, students complete the In-lab exercise to reinforce the concepts learned in the Prelab. Students leave the lab having received feedback on their Prelab and In-lab work.

2022-23 EVEN SEMESTER LAB CONTINUOUS EVALUATION

Sl No	Date	Experiment Name	Pre-Lab (10M)	In Lab			Post-Lab (10M)	Viva Voce (5M)	Total (50M)	Faculty Signature
				Writeup (10)	Execution (10)	Results (5)				
1										
2										
3										
4										
5										
6										
7										
8										

2022-23 EVEN SEMESTER LAB CONTINUOUS EVALUATION

Sl No	Date	Experiment Name	Pre-Lab (10M)	Viva Voce (5M)	In Lab			Post-Lab (10M)	Total (50M)	Faculty Signature
					Writeup (10)	Execution (10)	Results (15)			
9										
10										
11										
12										

LAB 01 :Deploy to GitHub via Git : A Practical #1

Date of the Session:___/___/___ **Time of the Session:_____to_____**

Prerequisite:

- **Software Engineering Methodologies.**
- **Python Programming.**
- **Basics of Web Development.**

Pre-Lab Task:

1) What is DevOps.

Ans:-

2) What is Git and GitHub ?

Ans:-

3) What are the advantages of Git ?

Ans:-

4) Explain branches in Git ?

Ans:-

In Lab Task:

1) **Deploy to GitHub via Git : A Practical**

- **Install Git and set up your GitHub account**
- **Execute the most popular commands in Git**
- **Push all the files from local repository to GitHub.**

Post Lab Task:

- **Pull changes from Remote repository to Local repository**

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 02 : Infrastructure as Code Using Terraform

Date of the Session:____/___/___ **Time of the Session:_____to_____**

Prerequisite:

- **AWS Fundamentals**
- **AWS CLI**

Pre-Lab Task:

1) Defiene IAC.

Ans:-

2) Explain the uses of Terraform CLI and list some basic CLI commands ?

Ans:-

3) What is the Terraform State?

Ans:-

In Lab Task:

1) Terraform Installation and working with terraform providers **.**

2) Deploy Your First Terraform Configuration on to AWS Cloud

3) Build and Test a Basic Terraform Module

Post Lab Task:

1) Migrate Terraform State to Terraform Cloud

Writing space for the Problem:(For Student's use only)

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Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 03 :Working with Input, Output Variables -Terraform(Modular Approach)

Date of the Session:____/___/___ Time of the Session:_____to_____

Prerequisite:

- **AWS Fundamentals**
- **AWS CLI**

Pre-Lab Task:

1) Explain Terraform Modules and its components?

Ans:-

2) List out the benefits of modular approach

Ans:-

In Lab Task:

1) Using Terraform Provisioners to Set Up an Apache Web Server on AWS

Post Lab Task:

1) Use Input and Output Variables to Query Data in AWS Using Terraform.

Writing space for the Problem:(For Student's use only)

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Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

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LAB 04 :Configuration Management using Ansible (Roles)

Date of the Session:____/___/___ Time of the Session:_____to_____

Prerequisite:

- **AWS Fundamentals.**
- **Web Development.**

Pre-Lab Task:

1) Difference between Ansible and terraform.

Ans:-

2) Define Inventory, Playbooks and Roles in Ansible.

Ans:-

In Lab Task:

1) Install Ansible on a control node and configure two managed servers for use with Ansible

2) Create a simple inventory and run an ansible command to verify our configuration is correct

3) Configure the playbook to start and enable the ‘httpd’ service on the ‘web’ group

Post Lab Task:

1) Configure the role to install the latest Nagios Client

Writing space for the Problem:(For Student's use only)

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Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

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LAB 05 :Working with prebuild Docker Images

Date of the Session:____/___/___ Time of the Session:_____to_____

Prerequisite:

- **Docker Daemon**
- **Docker CLI**
- **Desktop Docker**

Pre-Lab Task:

1) What is a Containerization.

Ans:-

2) What is Docker Repository?

Ans:-

3) Difference between Conatiner and Image?

Ans:-

In Lab Task:

1) Install Docker, Docker Desktop and Creating an Account in Docker Hub: A Practical
2) Explore Docker Hub for images that will run a website and get them into your development evnvironment and practice.
    a. Run a copy of the website in ‘httpd’

Post Lab Task:

1) Explore Docker Hub for images that will run a website and get them into your development environment and practice.
   a. Run a copy of the website in ‘Nginx’

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 06 :Three Tier web application using Docker

Date of the Session:___/___/___ **Time of the Session:_____to_____**

Prerequisite:

- **Docker Daemon**
- **Docker CLI**
- **Desktop Docker**

Pre-Lab Task:

1. What is Docker Compose?

Ans:-

2. Explain Docker Architecture?

Ans:-

In Lab Task:

1) Push and Pull your own image with pre-installations to/from repository
2) Building Container Images Using Docker files
3) Create a Docker Container Network

Post Lab Task:

1) Storing Container data in docker volumes
2) Host three tier web application using Docker

Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

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LAB 07 :Three Tier web application using Kubernetes

Date of the Session:____/___/___ **Time of the Session:_____to_____**

Prerequisite:

- **Linux Environment.**
- **Idea of VM.**
- **Docker**

Pre-Lab Task:

1) What is Kubernetes?

Ans:-

2) Differentiate Load Balancer and Auto Scaling?

Ans:-

In Lab Task:

1) Install minikube
2) Build a simple Kubernetes cluster with one master node and two worker nodes

Post Lab Task

1) Build a simple Kubernetes cluster with one master node and two worker nodes using Kubeadm
2) Create a deployment that uses the NGINX image
3) Expose only one pod on port 8081
4) Verify the NGINX version on the pod
5) Create a service for the deployment on port 80

Writing space for the Problem:(For Student's use only)

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Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 08 : Deploy a Web Application in AWS Elastic Kubernetes Service

Date of the Session:____/_____/_____ Time of the Session:___to___

Prerequisite:

- **Linux Environment.**
- **Idea of VM.**
- **Docker**

Pre-Lab Task:

1) Explain Kubernetes Components and Container Orchestration?

Ans:-

In Lab Task:

1) Deploy a Web Application in AWS Elastic Kubernetes Service: Practical

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

PostLab Task:

1) How does Amazon EKS work?

2) Does Amazon EKS work with my existing Kubernetes applications and tools?

3) Can I update my Kubernetes cluster to a new version?

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 09 :Jenkins Installation and Configuring on windows

Date of the Session:____/_____/_____ Time of the Session:___to___

Prerequisite:

- **Overview and Applications of DevOps in Development life cycle.**
- **Overview of Git.**
- **Web App Development.**
- **Python Programming.**

Pre-Lab Task:

4) What are the stages in DevOps Lifecycle and briefly explain each stage

Ans:-

5) What are the benefits of DevOps and In what way DevOps can achieve the goals of cloud computing.

Ans:-

In Lab Task:

1) Jenkins Installation and Configuring on windows**.**

PostLab Task:

1) Building CI/CD pipeline to deploy new version of Application (Jenkins)

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 10 :Continuous Integration with Jenkins:

Date of the Session:____/___/___ Time of the Session:_____to_____

Prerequisite:

- **DevOps life cycle.**
- **Web Development.**

Pre-Lab Task:

1) Categorise the DevOps tools and technologies that are used, according to the stages in the DevOps Lifecycle.

Ans:-

2) What Explain at least 2 tools and their limitations that are used in the DevOps Lifecycle at each stage.

Ans:-

3) Define CI/CD and List out the benefits of CI/CD.

Ans:-

In Lab Task:

1) Continuous Integration with Jenkins: A Practical

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

Post Task:

1) Explain Kubernetes, and how can you integrate Jenkins with Kubernetes?

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 11 :Continuous Deployment Using AWS Pipeline

Date of the Session:___/___/___ Time of the Session:_____to_____

Prerequisite:

- **Linux Environment.**
- **Idea of VM.**
- **AWS Environment and tools.**
- **Git and GitHub.**

Pre-Lab Task:

1) In DevOps, what role does pipeline?

Ans:-

2) What is CI and CD in AWS?

Ans:-

3) What type of applications does AWS deploy?

Ans:-

In Lab Task:

1) Set up a Continuous Deployment Pipeline using AWS CodePipeline

Writing space for the Problem:(For Student's use only)

Post Lab Task:

1) Create a static HTML web app in AWS for Devops Operations: A Practical.

Writing space for the Problem:(For Student's use only)

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Writing space for the Problem:(For Student's use only)

(For Evaluator's use only)

Comment of the Evaluator (if Any)	Evaluator's Observation Marks Secured:_____out of _____ Full Name of the Evaluator: Signature of the Evaluator Date of Evaluation:

LAB 12 :Working with Nagios Monitoring Tool

Date of the Session:_____/___/____ **Time of the Session:___to___**

Pre-Lab Task:

1) What is Continuous Monitoring
   Ans:-

2) Role of Monitoring Systems
   Ans:-

3) Types of Monitoring
   Ans:-

4) List out Popular Monitoring Tools
   Ans:-

In Lab Task:

1. Working with Nagios Monitoring Tool: A Practical

Post Lab Task:

1. What is the necessity of Continuous monitoring?

Writing space for the Problem:(For Student's use only)

Writing space for the Problem:(For Student's use only)

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