Lab Code	Lab Name	Credit
ADS501	Skill Based Lab course: Cloud Computing	2

Prerequisite: Computer Networks	
Lab Objectives:	
1	To make students familiar with key concepts of virtualization.
2	To make students familiar with various deployment models of cloud such as private, public, hybrid and community so that they start using and adopting appropriate types of cloud for their application.
3	To make students familiar with various service models such as IaaS, SaaS, PaaS, Security as a Service (SECaaS) and Database as a Service.
4	To make students familiar with security and privacy issues in cloud computing and how to address them.
Lab Outcomes:	
1	Implement different types of virtualization techniques.
2	Analyze various cloud computing service models and implement them to solve the given problems.
3	Design and develop real world web applications and deploy them on commercial cloud(s).
4	Explain major security issues in the cloud and mechanisms to address them.
5	Explore various commercially available cloud services and recommend the appropriate one for the given application.
6	Implement the concept of containerization

Lab:

1	**Title:** To study and Implement Infrastructure as a Service using AWS/Microsoft Azure. **Objective:** To demonstrate the steps to create and run virtual machines inside a Public cloud platform. This experiment should emphasize on creating and running Linux/Windows Virtual machines inside Amazon EC2 or Microsoft Azure Compute and accessing them using RDP or VNC tools.	4
2	**Title:** To study and Implement Platform as a Service using AWS Elastic Beanstalk/ Microsoft Azure App Service. **Objective:** To demonstrate the steps to deploy Web applications or Web services written in different languages on AWS Elastic Beanstalk/ Microsoft Azure App Service.	4

3	To study and Implement Storage as a Service using Own Cloud/ AWS S3, Glaciers/ Azure Storage.	2
4	To study and Implement Database as a Service on SQL/NOSQL databases like AWS RDS, AZURE SQL/ MongoDB Lab/ Firebase.	2
5	**Title:** To study and Implement Security as a Service on AWS/Azure **Objective:** To understand the Security practices available in public cloud platforms and to demonstrate various Threat detection, Data protection and Infrastructure protection services in AWS and Azure.	3
6	**Title:** To study and implement Identity and Access Management (IAM) practices on AWS/Azure cloud. **Objective:** To understand the working of Identity and Access Management IAM in cloud computing and to demonstrate the case study based on Identity and Access Management (IAM) on AWS/Azure cloud platform.	2
7	**Title:** To study and Implement Containerization using Docker **Objective:** To know the basic differences between Virtual machine and Container. It involves demonstration of creating, finding, building, installing, and running Linux/Windows application containers inside a local machine or cloud platform.	4
8	**Title:** To study and implement container orchestration using Kubernetes **Objective:** To understand the steps to deploy Kubernetes Cluster on local systems, deploy applications on Kubernetes, creating a Service in Kubernetes, develop Kubernetes configuration files in YAML and creating a deployment in Kubernetes using YAML,	2
9	**Mini-project:** Design a Web Application hosted on a public cloud platform [It should cover the concept of IaaS, PaaS, DBaaS, Storage as a Service, Security as a Service etc.]	4

Suggested Experiments: Students are required to complete the above experiments.	
Sr. No.	**Assignment**
1	Assignment based on selection of suitable cloud platform solution based on requirement analysis considering given problem statement
2	Assignment on recent trends in cloud computing and related technologies
3	Assignment on comparative study of different computing technologies [Parallel, Distributed, Cluster, Grid, Quantum)
4	Comparative study of different hosted and bare metal Hypervisors with suitable parameters along with their use in public/private cloud platform
5	Assignment on explore and compare the similar type of services provided by AWS and Azure [Any ten services]

Useful Links:	
1	https://docs.aws.amazon.com/
2	https://docs.microsoft.com/en-us/azure
3	https://kubernetes.io/docs/home/
4	https://docs.docker.com/get-started/

Term Work:	
1	Term work should consist of 8(min) to 12(max) experiments.
2	The final certification and acceptance of term work ensures satisfactory performance of laboratory work and minimum passing marks in term work.
3	Total 50 Marks (Experiments: 30 Marks , Mini Project: 10, Assingnment:10)