19CSE445	CLOUD COMPUTING	L-T-P-C: 2-0-3-3

Pre-Requisite(s):19CSE102 Computer Programming, 19CSE301 Computer Networks

Course Objectives

- This course introduces the basic principles of cloud computing, cloud native application development and deployment, containerization principles, micro-services and application scaling.
- It will also equip the students to understand major industry players in the public cloud domain for application development and deployment.

Course Outcomes

CO 1: Understand the basic principles of cloud computing.
CO 2: Apply cloud native application development for containerization and container orchestration.
CO 3: Analyze different types of cloud services – Delivery models, Deployment models.
CO 4: Implement different solution approaches in Cloud – containers in public cloud, setting up private cloud and convert monolithic applications to containers

CO-PO Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	1								1		3	2
CO2	3	2	2	2	3	2	3	2	2	2	2	2	3	2
CO3	3	2	2	2	3	2	3	2	1		2		3	2
CO4	3	2	2	2	3	2	3	2	2	2	2	2	3	2

Syllabus

Unit 1
Distributed Computing Taxonomy – Cluster, Grid, P2P, Utility, Cloud, Edge, Fog computing paradigms; Introduction to Cloud Computing – Cloud delivery models (XaaS), Cloud deployment models (Private, Public, Hybrid); Characteristics of Cloud, Major use cases of Cloud; disadvantages and best practices; Major public cloud players in the market; Security Issues and Challenges; Cloud Native application development – Introduction to JavaScript Cloud native application development

Unit 2
Public Cloud – Using public cloud for infrastructure management (compute and storage services), Web application deployment using public cloud services, and Deploying container images in public cloud, Overview of cognitive services, Case study on architecting cloud-based solutions for a chosen scenario

Unit 3
Virtualization – Basics, Cloud vs Virtualization, Types of virtualization, Hypervisor types; Containers – Introduction to dockers and containers, containerization vs virtualization, docker architecture, Use cases, Learn how to build container images, Operations on container images; Kubernetes – Need for orchestration, container orchestration methods, Introduction to Kubernetes, Kubernetes architecture, using YAML file, Running Kubernetes via minikube

Text Book(s)

Rajkumar Buyya et.al. Mastering cloud computing, McGraw Hill Education;2013.

Matthias K, Kane SP. Docker: Up & Running: Shipping Reliable Containers in Production. " O'Reilly Media, Inc.";
2018.

Reference(s)

Kocher PS. Microservices and Containers. Addison-Wesley Professional; 2018.

Sarkar A, Shah A. Learning AWS: Design, build, and deploy responsive applications using AWS Cloud components.
Packt Publishing Ltd; 2018.

Menga J. Docker on Amazon Web Services: Build, deploy, and manage your container applications at scale. Packt
Publishing Ltd; 2018.

Bentley W. OpenStack Administration with Ansible 2. Packt Publishing Ltd; 2016.

Evaluation Pattern

Assessment	Internal	External
Periodical 1	10	
Periodical 2	10	
*Continuous Assessment (Theory) (CAT)	10	
Continuous Assessment (Lab) (CAL)	40	
End Semester		30

*CA – Can be Quizzes, Assignment, Projects, and Reports.