SYLLABUS

CLOUD COMPUTING & DEVOPS · COURSE HANDOUT 2026

KUBERNETES

OS . DEPLOYMENTS . SERVIC
CONFIGMAPS . SECRETS . V
RESS . HELM . AUTOSCALING

DURATION	LEVEL	MODULES	MODE
50 Hours	**Intermediate to Advanced**	**8**	**Classroom · Online · Hybrid**

01 COURSE OVERVIEW

A Kubernetes course covering cluster architecture, workload objects and day-two operations. Learners run a local cluster and a managed one, deploying stateless and stateful workloads, configuring networking and storage, then handling upgrades, scaling, RBAC and troubleshooting.

The final project deploys a microservice application with Helm, ingress, autoscaling and monitoring.

WHO IT IS FOR

- DevOps and platform engineers
- Developers deploying to Kubernetes
- System administrators running clusters
- Engineers preparing for CKA or CKAD

PREREQUISITES

Docker fundamentals, Linux administration and basic YAML.

02 LEARNING OUTCOMES

01 Explain control plane and node components.

02 Deploy and roll out workloads declaratively.

03 Expose applications with services and ingress.

04 Manage configuration and secrets safely.

05 Attach persistent storage to stateful workloads.

06 Scale workloads manually and automatically.

07 Diagnose failing pods, nodes and networking.

03 MODULE STRUCTURE

8 MODULES

01 ARCHITECTURE

Control plane components

kubelet and kube-proxy

etcd

Cluster types

kubectl basics

Contexts and namespaces

LAB

LOCAL AND MANAGED CLUSTER

02 WORKLOADS

Pods

ReplicaSets

Deployments

Rolling updates and rollbacks

Jobs and CronJobs

DaemonSets

LAB

ZERO-DOWNTIME ROLLOUT

03 CONFIGURATION

- ConfigMaps
- Secrets
- Environment injection
- Resource requests and limits
- Probes
- Init containers

LAB

CONFIGURED APPLICATION

04 NETWORKING

- ClusterIP, NodePort, LoadBalancer
- DNS
- Ingress controllers
- Network policies
- Service mesh overview

LAB

INGRESS ROUTING

05 STORAGE

- Volumes
- PersistentVolumes and claims
- Storage classes
- StatefulSets
- Backup considerations

LAB

STATEFUL DATABASE

06 SCALING AND SCHEDULING

- Horizontal Pod Autoscaler
- Vertical scaling
- Cluster autoscaler
- Node selectors
- Affinity and taints
- Priority

LAB

LOAD-DRIVEN AUTOSCALING

07 PACKAGING AND OPERATIONS

- Helm charts and values
- Kustomize
- Upgrades
- Backups
- Logging
- Metrics server

LAB

HELM RELEASE

08 SECURITY AND TROUBLESHOOTING

- RBAC
- Service accounts
- Pod security standards
- Image policies
- Events and logs
- Debug containers

PROJECT

MICROSERVICE PLATFORM ON KUBERNETES

04 ASSESSMENT & CERTIFICATION

Module assignments and labs	**25%**
Mini projects	**20%**
Internal assessments	**15%**
Final project and review	**40%**

CERTIFICATION

Learners who complete all modules, submit the final project and clear the review receive a course completion certificate from Kaizen Infinities Private Limited. Project work is documented for the learner's portfolio, and interview preparation is included in the closing sessions.

05 CAREER OUTCOMES

ROLES THIS PROGRAMME PREPARES FOR

KUBERNETES ADMINISTRATOR **DEVOPS ENGINEER** **PLATFORM ENGINEER**
SITE RELIABILITY ENGINEER **CLOUD INFRASTRUCTURE ENGINEER**

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