Course Icon

Kubernetes Fundamentals - KCNA Prep Course

- **2 Days**
- **Lecture and Hands-on Labs**

Course Overview

The Kubernetes Fundamentals – KCNA Prep Course provides a balanced blend of hands-on technical training and conceptual understanding of the Kubernetes and Cloud Native ecosystem. Students gain practical experience managing workloads, networking, and storage within Kubernetes clusters while also mastering the key domains of the Kubernetes and Cloud Native Associate (KCNA) certification. This course bridges the gap between foundational operations and certification readiness — introducing essential cloud native topics such as container runtimes, autoscaling, observability, GitOps, CI/CD, service mesh, and serverless architecture. Participants leave fully prepared to operate real-world Kubernetes environments and confidently pursue the KCNA certification.

Review this course online at https://www.alta3.com/courses/kcna

Who Should Attend

- IT professionals
- System Administrators, DevOps Engineers
- Cloud Architects
- Developers

What You'll Learn

- Understand Kubernetes architecture and control plane components
- Deploy and manage workloads using Kubernetes primitives (Pods, Deployments, ReplicaSets)
- Apply resource management, logging, and security best practices
- Implement persistent storage and expose services externally
- Explain autoscaling, observability, and CI/CD concepts in a Cloud Native environment
- Describe serverless principles, open standards, and the CNCF governance model

Outline

From Containers to Kubernetes

- **Lecture:** Kubernetes Architecture
- **Lecture:** Pods and the Control Plane
- **Lecture:** Kubernetes the Alta3 Way
- **Lecture + Lab:** Deploy Kubernetes using Ansible
- Container Runtimes Overview

Cluster Basics

- **Lecture:** Namespaces and Fundamental Kubectl Commands
- **Lecture + Lab:** Creating and Configuring Namespaces
- **Lecture:** Kubectl get and sorting
- **Lecture + Lab:** Listing Resources with kubectl get

Pod Basics

- **Lecture:** YAML
- **Lecture:** Manifests for Pods
- **Lecture + Lab:** Create and Configure Basic Pods
- **Lecture:** API Versioning and Deprecations

Container Health, Security, and Observability

- **Lecture:** Kubectl port-forward
- **Lecture + Lab:** Kubectl port-forward
- **Lecture:** Kubectl exec and cp
- **Lecture + Lab:** Performing Commands inside a Pod
- **Lecture:** Readiness and Liveness Probes
- **Lecture + Lab:** Implement Probes and Health Checks
- **Lecture:** Pod Security Contexts
- **Lecture + Lab:** Applying Security Contexts
- Prometheus and Observability Fundamentals
- Telemetry and Cost Management in Kubernetes

Resource Management

- **Lecture:** Limits, Requests, and Namespace ResourceQuotas
- **Lecture + Lab:** Defining Resource Requirements, Limits and Quotas
- **Lecture + Lab:** Kubectl Top and Application Monitoring
- **Lecture:** Admission Controller
- **Lecture + Lab:** Create a Limit Range Admission Controller
- Autoscaling Fundamentals

Logging

- **Lecture:** Utilize Container Logs
- **Lecture + Lab:** Kubectl Log Command

Persistent Storage

- **Lecture:** Persistent Volumes, Claims, and StorageClasses
- **Lecture** + **Lab:** Using PersistentVolumeClaims for Storage

Deployments

- **Lecture:** Labels
- **Lecture** + **Lab:** Labels and Selectors
- **Lecture:** Annotations
- **Lecture:** ReplicaSets
- **Lecture** + **Lab:** Create and Configure a ReplicaSet
- **Lecture:** Deployments - Purpose and Advantages
- **Lecture** + **Lab:** Create and Configure a Deployment
- Autoscaling Deployments and Managing Rollouts

Services: ClusterIP, NodePort, Loadbalancer

- **Lecture:** Networking with Services
- **Lecture** + **Lab:** Expose Applications via Services
- Service Mesh Overview