



Information Technology

Kubernetes Fundamentals

Course Introduction

Welcome to "Kubernetes Fundamentals," a five-day course designed to provide a foundational understanding of Kubernetes for beginners. As organizations increasingly adopt containerization and cloud-native technologies, Kubernetes has emerged as the leading platform for orchestrating containers at scale. This course introduces the core concepts of Kubernetes, including its architecture, components, and workflows, enabling you to deploy and manage containerized applications effectively.

Through interactive sessions and hands-on labs, you will explore key Kubernetes features such as pod scheduling, networking, and storage. You will also learn how to use Kubernetes tools like `kubectl` and Helm to streamline application deployment and management. The course emphasizes practical application, ensuring that you gain the skills needed to work confidently with Kubernetes in real-world scenarios.

By the end of this course, you will have a solid understanding of Kubernetes fundamentals and be prepared to take on more advanced topics. Whether you are a developer, system administrator, or IT professional, this course provides the knowledge and skills necessary to succeed in Kubernetes-based projects and contribute to your organization's cloud-native initiatives.

Target Audience

This course is ideal for developers, system administrators, and IT professionals new to Kubernetes. It is particularly beneficial for individuals looking to gain a foundational understanding of Kubernetes and its practical applications.

Learning Objectives

- Understand Kubernetes architecture and core components.

- Deploy and manage containerized applications in Kubernetes clusters.
- Configure networking and storage for Kubernetes workloads.
- Use Helm charts for application deployment.
- Troubleshoot basic Kubernetes issues.

Course Outline

• Day 01

Foundations of Kubernetes

- Introduction to Kubernetes
 - Definition and importance of Kubernetes in cloud-native development.
 - Key components: Pods, Nodes, Clusters, and Control Plane.
- Setting Up Kubernetes
 - Installing Kubernetes locally using Minikube and kubectl.
 - Exploring managed Kubernetes services (GKE, EKS, AKS).
- Interactive Session
 - Hands-on exercise: Deploy a single-node Kubernetes cluster.

• Day 02

Core Concepts and Workloads

- Understanding Kubernetes Objects
 - Pods, Deployments, Services, and ConfigMaps.
 - Writing YAML manifests for Kubernetes resources.
- Managing Workloads
 - Scaling applications using ReplicaSets and Deployments.
 - Rolling updates and rollbacks.
- Practical Exercise
 - Deploy a multi-container application and perform rolling updates.

• Day 03

Networking and Storage

- Kubernetes Networking
 - Pod-to-Pod communication and ClusterIP vs. NodePort.
 - Ingress controllers and load balancing.

- Persistent Storage
 - Configuring PersistentVolumes (PVs) and PersistentVolumeClaims (PVCs).
 - Using storage classes for dynamic provisioning.
- Role Play
 - Set up an Ingress controller and expose an application externally.

• Day 04

Security and Monitoring

- Securing Kubernetes
 - Role-Based Access Control (RBAC) and namespaces.
 - Securing pods with security contexts and network policies.
- Monitoring and Logging
 - Using tools like Prometheus and Grafana for monitoring.
 - Centralized logging with Fluentd and Elasticsearch.

• Day 05

Advanced Topics and Best Practices

- Advanced Deployment Strategies
 - Blue-Green deployments and canary releases.
 - Autoscaling with Horizontal Pod Autoscaler (HPA).
- Troubleshooting
 - Debugging pods, nodes, and services.
 - Common Kubernetes errors and resolutions.
- Final Project Presentation: Comprehensive Kubernetes Deployment
- Closing Remarks

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 25, 2025	May 29, 2025	5 days	4250.00 \$	KSA - Riyadh
July 21, 2025	July 25, 2025	5 days	4250.00 \$	UAE - Dubai

FROM	TO	DURATION	FEEs	LOCATION
Oct. 6, 2025	Oct. 10, 2025	5 days	2150.00 \$	Virtual - Online