

---

## Kubernetes Fundamentals and Cluster Operations

**Duration: 4 Days**    **Course Code: VMKFCO**

---

### Overview:

This four-day course is the first step in learning about Containers and Kubernetes Fundamentals and Cluster Operations. Through a series of lectures and lab exercises, the fundamental concepts of containers and Kubernetes are presented and put to practice by containerizing and deploying a two-tier application into Kubernetes.

---

### Target Audience:

Anyone who is preparing to build and run Kubernetes clusters

---

### Objectives:

- By the end of the course, you should be able to meet the following objectives:
  - Build, test, and publish Docker container images
  - Become familiar with YAML files that define Kubernetes objects
  - Understand Kubernetes core user-facing concepts, including pods, services, and deployments
  - Use kubectl, the Kubernetes CLI, and become familiar with its commands and options
  - Understand the architecture of Kubernetes (Control plane and its components, worker nodes, and kubelet)
  - Learn how to troubleshoot issues with deployments on Kubernetes
  - Apply resource requests, limits, and probes to deployments
  - Manage dynamic application configuration using ConfigMaps and Secrets
  - Deploy other workloads, including DaemonSets, Jobs, and CronJobs
  - Learn about user-facing security using SecurityContext, RBAC, and NetworkPolicies
- 

### Prerequisites:

- Linux concepts and command line proficiency
  - General networking proficiency
-

## Content:

### 1 Course Introduction

- Introductions and objectives

### 2 Containers

- What and Why containers
- Building images
- Running containers
- Registry and image management

### 3 Kubernetes Overview

- Kubernetes project
- Plugin interfaces
- Building Kubernetes
- Kubectl CLI

### 4 Beyond Kubernetes Basics

- Kubernetes objects
- YAML
- Pods, replicas, and deployments
- Services
- Deployment management
- Rolling updates
- Controlling deployments
- Pod and container configurations

### 5 Kubernetes Networking

- Networking within a pod
- Pod-to-Pod Networking
- Services to Pods
- ClusterIP, NodePort, and LoadBalancer
- Ingress controllers
- Service Discovery via DNS

### 6 Stateful Applications in Kubernetes

- Stateless versus Stateful
- Volumes
- Persistent volumes claims
- StorageClasses
- StatefulSets

### 7 Additional Kubernetes Considerations

- Dynamic configuration
- ConfigMaps
- Secrets
- Jobs, CronJobs

### 8 Security

- Network policy
- Applying a NetworkPolicy
- SecurityContext
- runAsUser/Group
- Service accounts
- Role-based access control

### 9 Logging and Monitoring

- Logging for various objects
- Sidecar logging
- Node logging
- Audit logging
- Monitoring architecture
- Monitoring solutions
- Octant
- VMware vRealize® Operations Manager™

### 10 Cluster Operations

- Onboarding new applications
- Backups
- Upgrading
- Drain and cordon commands
- Impact of an upgrade to running applications
- Troubleshooting commands
- VMware Tanzu™ portfolio overview

## Further Information:

For More information, or to book your course, please call us on 00 971 4 446 4987

[training@globalknowledge.ae](mailto:training@globalknowledge.ae)

[www.globalknowledge.com/en-ae/](http://www.globalknowledge.com/en-ae/)

Global Knowledge, Dubai Knowledge Village, Block 2A, First Floor, Office F68, Dubai, UAE