

# Certified Kubernetes Administrator

This document provides the curriculum outline of the Knowledge, Skills and Abilities that a Certified Kubernetes Administrator (CKA) can be expected to demonstrate.

**Duration:** 5 Days

**Hands-On Format:** This hands-on class is approximately 80/20 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

## Module 1 – Core Concepts

Overview of Container Orchestration  
Introduction to Kubernetes  
Kubernetes Architecture

## Module 2 – Installation, Configuration & Validation

Design a Kubernetes Cluster  
Installation of Kubernetes Master and Nodes  
Choose a Network Solution  
Verify Installation

## Module 3 – Managing Resources

Managing Pods  
Managing Labels & Selector  
Managing Replication Controller & Replica Set  
Managing Service

## Module 4 – Scheduling

Manual Scheduling  
Taint and Tolerations  
Node Selector  
Node Affinity

## Module 5 – Application Lifecycle Management

Overview of Deployment  
Deployment Strategies  
Managing Deployment

## Module 6 – Environment Variable

Plain Key  
Config Map  
Secret  
Mount Variable as Volume

## **Module 7 – Storage**

Volumes  
Persistent Volumes  
Persistent Volume Claim

## **Module 8 – Security**

Kubernetes Authentication  
Managing Users in Kubernetes  
Service Account  
Managing Roles and Role Binding  
Managing Cluster Role and Cluster Role Binding  
Security Context

## **Module 9 – Cluster Maintenance**

OS Upgrade  
Upgrade Cluster Version  
Static Pod  
ETCD Backup  
Cron Job

## **Module 10 – Logging and Monitoring**

Understand how to Monitor all Cluster Components  
Understand how to Monitor Applications  
Manage Cluster Components Logs  
Manage Application Logs  
Prometheus Tool

## **Module 11 – Networking in Kubernetes**

Kubernetes Networking  
Understand CNI  
Understand Pod Networking Concepts  
Configure DNS  
Configure and Manage Ingress Rule  
Namespace  
Metal Load Balancer

## **Module 12 – Troubleshooting**

Troubleshoot ETCD Failure  
Troubleshoot Kubelet Failure  
Troubleshoot Container Runtime Failure  
Troubleshoot Scheduler Failure

## **Module 13 – High Availability Cluster**

Multi-Master Setup