

## 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.

**Lab:** Koenig DC + Azure Pass

### 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  
Managing DaemonSets

### Module 4 – Scheduling

Manual Scheduling  
Taint and Tolerations

### 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