Day 1 – Authentication & Identity Management

- Course Introduction & Objectives
- OpenShift Enterprise Security & Authentication Concepts
- LDAP & OIDC Integration
- Configuring LDAP identity provider
- Configuring OIDC (Keycloak, Azure AD, etc.)
- Group Synchronization & RBAC Mapping

Labs:

- Configure cluster authentication with LDAP
- Configure cluster authentication with OIDC
- Test role bindings with external groups

Day 2 – Backup, Restore & Migration (OADP)

- Introduction to OADP (OpenShift APIs for Data Protection)
- Architecture: Velero, Restic, CSI Snapshots
- Application Backup & Restore workflows
- Backing up CRDs, PVCs, secrets
- Restoring applications across namespaces
- Application Migration
- Migrating workloads between clusters

- Handling storage classes & PV compatibility

Labs:

- Configure OADP and perform application backup
- Restore workloads in same cluster
- Migrate workloads between clusters

Day 3 – Cluster Partitioning & Pod Scheduling

- Cluster Partitioning Strategy
- Node labeling & taints/tolerations
- Reserving/dedicating nodes for workloads
- Pod Scheduling
- Node affinity & anti-affinity
- Pod topology spread constraints
- Running workloads only on dedicated nodes

Labs:

- Partition nodes (infra vs application)
- Configure taints & tolerations
- Use node selectors & affinity rules
- Validate pod placement using sample apps

Day 4 – GitOps + ACM + Certificate Management

GitOps with OpenShift

- GitOps Principles
- Installing & configuring OpenShift GitOps (ArgoCD)
- Application Deployment with GitOps
- Sync policies (manual & automated)
- Multi-cluster deployments with GitOps

Advanced Cluster Management (ACM)

- Multi-cluster lifecycle management
- Governance, risk & compliance policies
- Integrating ArgoCD with ACM
- Cluster import & management workflows

Certificate Management

- Overview of certificate management in OpenShift
- Using cert-manager for cluster & app certificates
- Issuers, ClusterIssuers, auto-renewal
- Securing routes, ingress & internal services

Labs:

- Install OpenShift GitOps Operator
- Deploy an application using GitOps

- Manage multi-cluster deployments via ACM
- Configure cert-manager and issue certificates

Day 5 – Monitoring, Logging, Service Mesh, VM Migration & Troubleshooting

Monitoring & Observability

- OpenShift Monitoring stack architecture
  (Prometheus, Alertmanager, Grafana, Thanos)
- Performance troubleshooting & alerting

Labs:

- Query metrics with PromQL
- Create Grafana dashboards

Logging

- Log pipeline architecture (Loki, Fluentd/Vector, Elasticsearch, Kibana)
- Centralized logging & queries

Labs:

- Deploy logging stack
- Query application & cluster logs

Istio Service Mesh

- Service Mesh architecture (Istio/Maistra)

- Traffic management, routing, retries
- mTLS, zero-trust networking
- Observability with Kiali, Jaeger

VM Migration

- OpenShift Virtualization overview
- Migration Toolkit for Virtualization (MTV)
- Migrating VMs (VMware → OpenShift)
- Storage & network considerations

Troubleshooting Module

- Systematic troubleshooting approach
- Debugging pods, nodes, networking
- Using logs, events & monitoring for RCA