Course Outline:

CN100: Docker Containerization Essentials

- Containerization motivations and implementation
    - Usecases
    - Comparison to virtual machines
- Creating, managing and auditing containers
    - Container implementation from the Linux kernel
    - Container lifecycle details
    - Core container creation, auditing and management CLI
- Best practices in container image design
    - Layered filesystem implementation and performance implications
    - Creating images with Dockerfiles
    - Optimising image builds with multi-stage builds and image design best practices
- Single-host container networking
    - Docker native networking model
    - Software defined networks for containers
    - Docker-native single-host service discovery and routing
- Provisioning external storage
    - Docker volume creation and management

    - Best practices and usecases for container-external storage.

CN120: Kubernetes Application Essentials

- Make effective use of pod architecture
- Deploy workloads as Kubernetes controllers
- Provision configuration at runtime to Kubernetes workloads
- Network pods together across a cluster using native services
- Provision highly available storage to Kubernetes workloads
- Package an application as a Helm chart

CN220: Kubernetes Operations

- Kubernetes High Availability
    - Review the basic architecture of a Kubernetes cluster
    - Install a well-validated HA Kubernetes cluster on a collection of hosts
    - Load balance kubectl commands across an HA Kubernetes cluster
- Managing Application Deployment
    - Review how pods are scheduled on worker nodes
    - Examine the node selector
    - Discuss implementing the impact of taints and tolerations for Kubernetes workloads

    - Review both pod and node affinity and anti-affinity

- Releasing Application Updates
    - Discuss releasing updates to applications running on the Kubernetes platform
    - Explore native tooling for updating application
    - Examine how Helm manages updating applications
- Application High Availability
    - Review the architecture required to achieve high availability for applications
    - Discuss best practices for using liveness and readiness probes
    - Explore Kubernetes auto-scaling of applications
    - Discuss how to prioritizing Kubernetes workloads
- Routing Network Traffic
    - Discuss network routing options within Kubernetes
    - Discuss the benefits of the Ingress controller and object
    - Examine the Ingress object and controller pattern
- Provisioning Storage
    - Review available storage options for applications
    - Discuss constraints of persistent storage in a standard Kubernetes cluster deployment
    - Examine the storageClass object
- Kube Security: Implementing RBAC

    - Discuss RBAC implementation within Kubernetes
    - Examine Kubernetes RBAC components
    - Review Auditing within Kubernetes
    - Determine how to enable Auditing within a Kubernetes cluster
- Kubernetes Network Security
    - Review the the Kubernetes Networking Model
    - Discuss how Network Security is managed within the Kubernetes cluster
    - Examine managing network security with native and non-native Kubernetes tooling
    - Explain the native method of creating Network Policies
- Securing an Application Workload
    - Identify security mechanisms available to security between containers, pods, and the Kubernetes cluster
    - Discuss strategies for enabling flexibility within security policy while maintaining security compliance
    - Examine how to enable Pod Security Policies
- Multi-Tenancy in Kubernetes
    - Discuss multi-tenancy in a Kubernetes cluster
    - Examine native Kubernetes objects used for enabling multi-tenancy capability
    - Discuss multi-tenancy methods for Kubernetes