

Cloud and DevOps Engineering (Level I + Level II)

(Enterprise Linux Administration + Linux Automation Using Ansible + OpenShift - Containers and Kubernetes + Cloud - AWS / Azure + Python + DevOps tools)

INTRODUCTION

Cloud and DevOps Engineering is an industry-designed DevOps training program that will help you acquire the key skills needed to be a DevOps expert. You will be able to acquire the complete DevOps methodologies to bridge the gap between IT development (Dev) and operations (Ops) teams.

This industry-oriented course is developed by both the Technical Support division & Training division of **ipsr solutions limited**. IPSR is a **public limited IT company** with 23 years of expertise in [Software product development](#), [Training services](#), [Placement services](#) & [Digital Marketing services](#). During the past 2 decades, IPSR has trained candidates from **60+ countries** and helped **100000+ candidates** to build their IT career. Our IT services division is a pioneer in development of **Academic solution products**, incorporating cutting edge technologies like Artificial Intelligence, Data Analytics, Machine learning and Cloud Computing. Live industry experts from this IT Tech Support division contribute a major role in delivering this course. Our placement division is having **1600+ placement tie-up companies** and we are conducting [recruitment on all days](#).

The Course curriculum is designed and developed by a team of expertise panel lead by following academicians and industry experts

- ❑ **Dr. Mendus Jacob, M.Sc., M.Phil., Ph.D., MloD**
 - ❑ M.D & C.E.O - IPSR & Valin Technologies, U.K & USA
 - ❑ Director - MCA, Marian College, Kuttikkanam (Autonomous)
 - ❑ Former Director of School of Applicable Mathematics, M.G. University.
 - ❑ Academician and Entrepreneur with 30+ years' experience

- ❑ **Dr. Sunil Job K.A, M.Sc, M.Ed, M.Phil, Ph.D., RHCE**
 - ❑ Chief of Academic Solutions - IPSR



- ❑ Former college Principal and a Specialist in Data Analytics & Machine Learning
- ❑ Blogger and a Resource person for National conferences
- ❑ Academician with 25+ years' experience

What you'll learn

Through this training, you will learn technologies like Linux, Automation, Cloud, Containers, Kubernetes, Openshift, Python and DevOps tools like Jenkins, Terraform and Git through a hands-on learning approach.

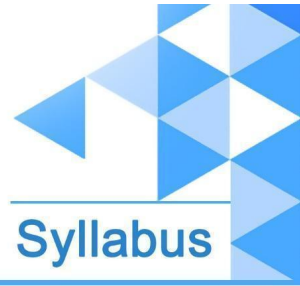
Course Outcome (CO)

While successfully completing this course, the learner will be able to:

- **Manage Enterprise Linux**
- **Automate Linux Administration Tasks**
- **Deploy and Manage applications in cloud and container platforms**
- **Implement and manage DevOps methodology**
- **Operating a Production Kubernetes Cluster**

What does this course give you?

Skills required to become DevOps Engineer and Kubernetes Cluster Administrator.



Units and Syllabuses

Level I

Duration: 260 hours

Unit I - Enterprise Linux Administration

Module1: Access the command line, Manage files from the command line, Get help in Enterprise Linux, Create, view, and edit text files, Manage local users and groups, Control access to files, Monitor and manage Linux processes, Control services and daemons

Module2: Configure and secure SSH, Analyze and store logs, Manage networking, Archive and transfer files, Install and update software packages

Module3: Access Linux files systems, Analyze servers and get support, improve command line productivity, Schedule future tasks

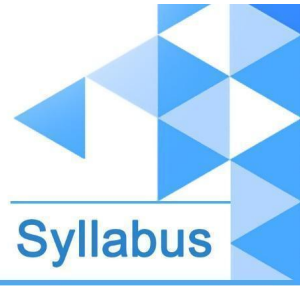
Module4: Tune system performance, Manage SELinux security, Manage logical volumes, Access network-attached storage

Module5: Control the boot process, Manage network security, Install Red Hat Enterprise Linux, Run Containers

Unit II - Linux Automation Using Ansible

Module1: Introduce Ansible, Implement an Ansible playbook

Module2: Manage variables and facts, Implement task control



Module3: Deploy files to managed hosts, Manage complex plays and playbooks

Module4: Simplify playbooks with roles, Troubleshoot Ansible

Module5: Automate common Linux system administration tasks with Ansible.

Unit III - OpenShift - Containers and Kubernetes

Module1: Describe how software can run in containers orchestrated by Red Hat OpenShift Container Platform.

Module2: Creating containerized services, Managing containers

Module3: Managing container images, Creating custom container images

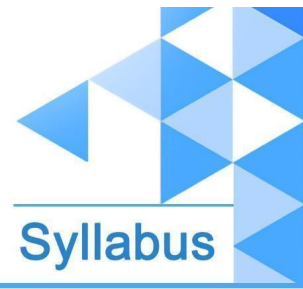
Module4: Deploy single container applications on OpenShift Container Platform.

Module5: Deploy applications that are containerized using multiple container images, Troubleshooting containerized applications

Optional Add-on (Duration: 4 days): [Red Hat OpenShift I: Containers & Kubernetes \(DO180\)](#) + [Red Hat Certified Specialist in Containers and Kubernetes exam\(EX180\)](#)

Unit IV - Cloud - AWS / Azure

Module1: Implementation of Identity Access Management (IAM) for security and managing access to various resources in AWS. Creating IAM user, groups, roles and policies



Module2: Configure EC2 Instances and implementation of auto scaling for instances. Deploy, Manage and Scale applications using container orchestration service. Speed up hosted websites using Content Delivery Network. Building decoupled applications using SNS, SQS. Understanding Serverless computing services.

Module3: Storing files securely using the Object Storage method using S3. Share Storage Disks among Servers via Network. Setup Database Engines and Secure Servers and Services. Implementation of Data Migrations and Data Transfer tools.

Module4: Implementation of VPC and its components. Distributing traffic using Load Balancers. Configure DNS using Route53. Configuring VPN to establish secure connections to on-premise networks.

Module5: Monitor Server Resources using CloudWatch. Creating backup of instances of other services. Auditing AWS environment with CloudTrail. Schedule Event Rules using Target based services

OR

Module1: Manage Azure Active Directory (Azure AD) objects including user, group and device. Implementation of role-based access control (RBAC). Management of subscription and configuration of governance strategies.

Module2: Implementation of Azure Storage account services. Configuring Azure Blob storage and lifecycle management. Creation of Azure file shares and file sync services. Configure network access and authentication to the storage account. Installation and configuration of Storage Explorer and AzCopy tools.

Module3: Configure Virtual machines and VMSS. Implementation of Azure App Services. Implementation of various container services in Azure. Automate deployment of virtual



machines (VMs) by using Azure Resource Manager templates

Module4: Create and customize Virtual network components. Configuring secure access to virtual networks NSGs, Azure Firewall, Bastion. Configuring load balancing. Understanding methods to Monitor and troubleshoot virtual networks. Integrate an on-premises network with an Azure virtual network with a VPN.

Module5: Monitor resources by using Azure Monitor. Implement backup and recovery.

Unit V - PYTHON PROGRAMMING

Module1: Basics of python programming

Module2: Python functions and modules

Module3: Object-oriented programming in python

Module4: Database: MySQL

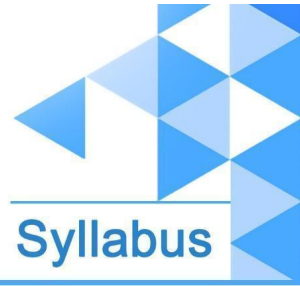
Unit VI - DEVOPS TOOLS

Module1: Introduction to DevOps methodology

Module2: Git basics and how it works

Module3: Introduction to Continuous Integration(CI), Jenkins basics and how it works

Module4: Terraform basics and how it works



Level II (Optional Add-ons)

A) Red Hat OpenShift Administration II: Operating a Production Kubernetes Cluster (DO280) (Duration: 4 days) + Red Hat Certified Specialist in OpenShift Administration exam (EX280)

Describe the Red Hat OpenShift Container Platform

Describe the architecture of the Red Hat OpenShift Container Platform (RHOCP).

Verify the health of a cluster

Describe OpenShift installation methods and verify the health of a newly installed cluster.

Configure authentication and authorization

Configure authentication with the HTTPasswd identity provider and assign roles to users and groups.

Configure application security

Restrict permissions of applications using security context constraints and protect access credentials using secrets.

Configure OpenShift networking for applications

Troubleshoot OpenShift software-defined networking (SDN) and configure network policies.

Control pod scheduling

Control which nodes a pod runs on.

Describe cluster updates

Describe how to perform a cluster update.

Manage a cluster with the web console

Manage a Red Hat OpenShift cluster using the web console.

OR

B) Certified kubernetes Administration (CKA) (Duration: 35 Hrs)

Core Concepts



- Cluster Architecture
- API Primitives
- Services & Other Network Primitives

Scheduling

- Labels & Selectors
- Resource Limits
- Manual Scheduling
- Daemon sets
- Multiple Schedulers
- Scheduler Events
- Configure Kubernetes scheduler

Logging Monitoring

- Monitoring Cluster Components
- Monitor Cluster Components
- Monitor Application ● Application logs

Application Lifecycle Management

- Rolling Updates and Roll Backs in Deployment
- Configure Applications
- Scale Applications
- Self Healing Application

Cluster Maintenance

- Cluster Upgrade process



- Operating System Upgrades
- Backup and Restore Methodologies

Security

- Authentication & Authorization
- Kubernetes Security
- Network Policies
- TLS Certificates for cluster Components
- Image Securely
- Security Contexts
- Secure persistent key value store

Storage

- Persistent Volumes
- Access Modes for Volumes
- Persistent Volume Claims
- Kubernetes storage Object
- Configure Application with Persistent Storage

Networking

- Prerequisites- Network,switch,Routing Tools
- PreRequisites- Network Namespaces
- PreRequisites- DNS and CoreDNS
- PreRequisite -Network in Docker
- Networking Configuration on Cluster Nodes
- Service Networking



- POD Networking Concepts
- Network Load Balancer
- Ingress
- Cluster DNS
- CNI in Kubernetes

Installation, Configuration & Validation

- Design a Kubernetes Cluster
- Secure Cluster Communication
- Provision Infrastructure
- Run & Analyze end to end test
- Install Kubernetes Master and Nodes
- HA Kubernetes Cluster
- Choose a Network Solution
- Node end to end tests
- Kubeadm

Troubleshooting

- Application failure
- Control Plane Failure
- Worker Node Failure
- Networking



Contact Us

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