



Course Curriculum: Your 14 Module Learning Plan

## OpenStack Certification Training

### About Edureka

Edureka is a leading e-learning platform providing live instructor-led interactive online training. We cater to professionals and students across the globe in categories like *Big Data & Hadoop, Business Analytics, NoSQL Databases, Java & Mobile Technologies, System Engineering, Project Management and Programming.*

We have an easy and affordable learning solution that is accessible to millions of learners. With our students spread across countries like the US, India, UK, Canada, Singapore, Australia, Middle East, Brazil and many others, we have built a community of over 1 million learners across the globe.

### About the Course

Edureka's OpenStack Certification Training course provides students with a detailed understanding of steps necessary to operate OpenStack environment. Participants will go through architectures, live implementations, provisioning and lab setup for the real-world challenges faced by OpenStack experts.

## Module 1
## Understanding Cloud and OpenStack

**Learning Objectives** - In this module, you will learn the concepts of virtualization and how it's used on the cloud. Once you understand the relationship between virtualization and the cloud, you will learn more about the cloud and OpenStack along with its ecology and components.

**Topics**

- ✓ Basics of virtualization
- ✓ Relationship: Virtualization & cloud
- ✓ Introduction to cloud and cloud models
- ✓ Introduction to OpenStack
- ✓ OpenStack ecology and OpenStack services
- ✓ Preparing your environment for lab sessions

## Module 2
## Keystone (OpenStack authentication system)

**Learning Objectives** - In this module, you will learn about the concept of authentication and identity system for the Keystone service.

**Topics**

- ✓ OpenStack Identity
- ✓ Users
- ✓ Credentials
- ✓ Tokens
- ✓ Identity Management
- ✓ Service Catalog
- ✓ Role Based Access Control (RBAC)
- ✓ Keystone Internal Architecture
- ✓ Token Validation – API
- ✓ Setting up Keystone as a part of the Controller node

## Module 3
## Nova (OpenStack Compute Service)

**Learning Objectives** - In this module, you will understand the OpenStack compute service and how we utilize virtualization to successfully run Nova.

**Topics**

- ✓ OpenStack Compute Service Architecture
- ✓ Nova internals
- ✓ KVM based Architecture
- ✓ Instances, Images and Nova-Network usage
- ✓ Setting up the Nova node.

## Module 4
## Cinder (OpenStack Block Service)

**Learning Objectives** - In this module, you will learn about the OpenStack block service and utilize it along with Nova.

**Topics**

- ✓ A deep dive into OpenStack
- ✓ Cinder Internals
- ✓ Cinder backend
- ✓ Industry implementations
- ✓ Installation of Cinder
- ✓ Manage\troubleshoot Cinder

## Module 5
## Glance (OpenStack Image Service)

**Learning Objectives** - In this module, you will learn about the OpenStack Image service and how to leverage it for image uploads and downloads.

**Topics**

- ✓ OpenStack Glance Architecture
- ✓ Glance internals
- ✓ Image conversions to qcow2
- ✓ Installation of Glance
- ✓ Best practices on Glance store backend
- ✓ Image uploads and downloads

## Module 6
## Neutron (OpenStack Neutron Service)

**Learning Objectives** - This is the most critical but slightly complex topic. Here, we learn about Neutron and successfully implementing it.

**Topics**

- ✓ Deep-dive on the OpenStack Neutron Architecture
- ✓ ML2
- ✓ ML3 plugins
- ✓ Installation of Neutron
- ✓ Network creation
- ✓ Bridging
- ✓ Router creation
- ✓ Core Neutron plugins and network configuration

### Module 7
### Horizon (OpenStack Dashboard Service)

**Learning Objectives -** In this module, we will install GUI for OpenStack.

**Topics**

- ✓ Introduction to Horizon
- ✓ Installation of Horizon
- ✓ Django
- ✓ GUI walkthrough

### Module 8
### Heat (OpenStack Orchestration Service)

**Learning Objectives -** In this module, we will learn about heat orchestration.

**Topics**

- ✓ Deep-dive on OpenStack Heat Architecture Heat agents
- ✓ Write Heat templates
- ✓ Installation of Heat service
- ✓ Integrate heat templates to automate instance launches

### Module 9
### Ceilometer (OpenStack Billing Service)

**Learning Objectives -** In this module, we will learn about the billing and alerting service.

**Topics**

- ✓ A deep-dive into OpenStack Ceilometer
- ✓ Data polling
- ✓ Retrieval and setting up alarms Installation of Ceilometer
- ✓ Integrate Heat + Ceilometer for automation of instance\networks\storage launches
- ✓ Create Meters

### Module 10
### Trove (OpenStack Database as a service)

**Learning Objectives -** In this module, we will install OpenStack database as a service module.

**Topics**

- ✓ An OpenStack Trove architectural deep-dive Installation of Trove
- ✓ Launching database from CLI or the dashboard

### Module 11
### Swift (OpenStack's Object Storage)

**Learning Objectives -** In this module, we will cover the OpenStack Block Storage service called Swift.

**Topics**

- ✓ Installation of Swift
- ✓ Swift rings
- ✓ Image locations
- ✓ Component based uploads
- ✓ Replication
- ✓ Account Reaping
- ✓ Ring-building
- ✓ Integrate Swift with Glance to use as an image store

### Module 12
### Installation and troubleshooting

**Learning Objectives -** In this module, we will install a 3 Node Architecture of OpenStack.

**Topics**

- ✓ Environment Setup
- ✓ Building a controller node
- ✓ Building a network node
- ✓ Building a compute node
- ✓ Adding additional compute nodes to the existing OpenStack implementation

### Module 13
### OpenStack Operators Guide

**Learning Objectives -** In this module, we will be performing break & fix operations to the OpenStack environment.

**Topics**

- ✓ Real-time problem resolutions
- ✓ Real-time operations of OpenStack environment
- ✓ Bug/Issue tracking
- ✓ Troubleshooting scenarios and resolutions

### Module 14
### Central Logging

**Learning Objectives -** In this module, we will be installing relevant tools to collect OpenStack logs and push them to a central logging server.

**Topics**

- ✓ Installation of ELK STACK
- ✓ Configuration of ELK Stack for OpenStack
- ✓ Rotation of logs

### Project

#### What are the system requirements for this course?
The system requirements include minimum 4 GB RAM, i3 processor or above and 20 GB HDD.

#### How will I execute the practicals?
For your practical work, we will help you to setup OpenStack environment in two types, i.e. single node installation or multi node installation and we will help you with installing additional compute hosts to the environment. In case you come across any doubt, the 24*7 support team will promptly assist you.

#### Which Case-Studies will be a part of the course?
Towards end of the course, you can work on a live project involving implementation of an OpenStack cloud.

- ✓ You can build it from grounds up and implement techniques that are used in real-time deployments
- ✓ You can operate and administer OpenStack environments by understanding the core components of OpenStack using both UI and CLI
- ✓ The project will involve creating keypairs, volumes, instances, SSH keys among others
- ✓ You can learn how services are configured by deploying the OpenStack

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