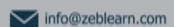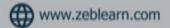# ZebLearn

AWS & DevOps

"Change is the end result of all true learning."

ZebLearn is an ISO 9001-2015 Certified Company that is co-founded by highly experienced industry professionals and alumni of top universities. It is headquartered at Noida & It is one of the fastest-growing solution providers in the field of Education, IT, Consulting and Corporate Trainings.

AWS Syllabus

Introduction to Cloud Computing & AWS

- ❖ What is Cloud Computing
- ❖ Cloud Service & Deployment Models
- ❖ How AWS is the leader in the cloud domain
- ❖ Various cloud computing products offered by AWS
- ❖ Introduction to AWS S3, EC2, VPC, EBS, ELB, AMI
- ❖ AWS architecture and the AWS Management Console, virtualization in AWS (Xen hypervisor)
- ❖ What is auto-scaling
- ❖ AWS EC2 best practices and cost involved

Elastic Compute and Storage Volumes

- ❖ Introduction to EC2
- ❖ Regions & Availability Zones(AZs)
- ❖ Pre-EC2, EC2 instance types
- ❖ Comparing Public IP and Elastic IP
- ❖ Demonstrating how to launch an AWS EC2 instance
- ❖ Introduction to AMIs, Creating and Copying an AMI
- ❖ Introduction to EBS
- ❖ EBS volume types
- ❖ EBS Snapshots
- ❖ Introduction to EFS
- ❖ Instance tenancy- Reserved and Spot instances
- ❖ Pricing and Design Patterns

AWS Syllabus

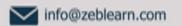## Load Balancing, Autoscaling and DNS

❖ Introduction to Elastic Load Balancer

❖ Types of ELB – Classic, Network and Application

❖ Load balancer architecture

❖ Cross-zone load balancing

❖ Introduction to Auto Scaling, vertical and horizontal scaling, the lifecycle of Auto Scaling

❖ Components of Auto Scaling, scaling options and policy, instance termination

❖ Using load balancer with Auto Scaling

❖ Pre-Route 53 – how DNS works

❖ Routing policy, Route 53 terminologies, Pricing.

Virtual Private Cloud

❖ What is Amazon VPC,

❖ VPC as a networking layer for EC2,

❖ IP address and CIDR notations,

❖ Components of VPC – network interfaces, route tables, internet gateway, NAT,

❖ Security in VPC – security groups and NACL, types of VPC, what is a subnet, VPC peering with scenarios, VPC endpoints, VPC pricing and design patterns.

Storage - Simple Storage Service (S3)

❖ Introduction to AWS storage

❖ Pre-S3 – online cloud storage

❖ API, S3 consistency models

❖ Storage hierarchy, buckets in S3

❖ Objects in S3, metadata and storage classes, object versioning, object lifecycle management, cross-region replication, data encryption, connecting using VPC endpoint, S3 pricing.

AWS Syllabus

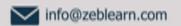## Load Balancing, Auto scaling and DNS

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- ❖ Load balancer architecture

Databases and In-Memory Data Stores

- ❖ What is a database, types of databases, databases on AWS
- ❖ Introduction to Amazon RDS
- ❖ Multi-AZ deployments, features of RDS
- ❖ Read replicas in RDS, reserved DB instances
- ❖ RDS pricing and design patterns
- ❖ Introduction to Amazon Aurora, benefits of Aurora, Aurora pricing and design patterns
- ❖ Introduction to Dynamo DB, components of Dynamo DB, Dynamo DB pricing and design patterns
- ❖ What is Amazon Redshift, advantages of Redshift
- ❖ What is Elasti Cache, why Elasti Cache.

Management and Application Services

- ❖ Introduction to Cloud Formation
- ❖ Cloud Formation components
- ❖ Cloud Formation templates
- ❖ The concept of Infrastructure-as-a-code
- ❖ Functions and pseudo parameters
- ❖ Introduction to Simple Notification Service, how does SNS work
- ❖ Introduction to Simple Email Service, how does SES work
- ❖ Introduction to Simple Queue Service, how does SQS work

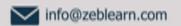# AWS Syllabus

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AWS Syllabus

Access Management and Monitoring Services

❖ Pre-IAM, why access management

❖ Amazon Resource Name (ARN), IAM features

❖ Multi-factor authentication (MFA) in IAM, JSON

❖ IAM policies, IAM permissions, IAM roles, identity federation, pricing

❖ Introduction to Cloud Watch, metrics and namespaces, Cloud Watch architecture, dashboards in CW, Cloud Watch alarms, Cloud Watch logs, pricing and design patterns

❖ Introduction to Cloud Trail, tracking API usage

Automation and Configuration management

❖ What is AWS Lambda

❖ How Lambda is different from EC2

❖ Benefits and limitations of Lambda

❖ How does Lambda work

❖ Use cases of Lambda, Lambda concepts

❖ Integration S3 with Lambda

❖ What is Elastic Beanstalk, how does Beanstalk work, Beanstalk concepts, Beanstalk pricing

❖ What is configuration management

❖ What is AWS Ops Works, AWS Ops Works benefits

❖ Cloud Formation vs Ops Works, services in Ops Works, AWS Ops Works Stacks, Ops Works pricing.

AWS Syllabus

Amazon FSx and Global Accelerator

❖ What is FSx

❖ Types of FSx,FSx for Windows server

❖ How does FSx for Windows File Server work, FSx for Lustre

❖ Use cases of FSx

❖ Automatic failover process

❖ Supported clients and access methods

❖ What is a Global Accelerator, How Global Accelerator works, Listeners and Endpoints

❖ What are AWS Organizations, Features of AWS Organizations, Managing multiple accounts

❖ What are ENIs, ENAs and EFAs, Working with network interfaces

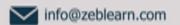❖ Enhanced Networking with ENA, EFA with MPI, Monitoring an EFA
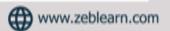
Architecting AWS – whitepaper

❖ Important guidelines for creating a well-architected AWS framework that is resilient and performant

❖ Designing of fault-tolerant and high-availability architecture

❖ Resilient storage

❖ Decoupling mechanism

❖ Multi-tier architecture solution

❖ Disaster recovery solution

❖ Scalable and elastic solutions.

DevOps on AWS

❖ What is DevOps,

❖ Introduction to AWS DevOps,

❖ AWS Developer tools – CodeCommit, CodeBuild, CodeDeploy and CodePipeline, integrating GitHub with CodePipeline,

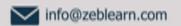❖ Creating a DevOps lifecycle using AWS DevOps tools.

AWS Syllabus

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- ❖ Use cases of FSx
- ❖ Automatic failover process
- ❖ Creating a DevOps lifecycle using AWS DevOps tools.

AWS Migration

- ❖ What is Cloud migration
- ❖ Why migration is important
- ❖ Migration process in AWS, the 6 R's migration strategy
- ❖ Virtual machine migration, migrating a local vm onto the AWS cloud
- ❖ Migrating databases using Database Migration Service (DMS)
- ❖ Migrating a local database to RDS
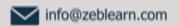- ❖ Migrating an on-premises database server to RDS using DMS, other migration services.

DevOps Syllabus

Infrastructure Setup

- ❖ EC2 Walkthrough
- ❖ Installation of DevOps Tools on cloud
  - ❖ Git
  - ❖ Docker
  - ❖ Selenium
  - ❖ Maven
  - ❖ Jenkins
  - ❖ Puppet
  - ❖ Ansible
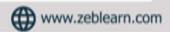 - ❖ Kubernetes
  - ❖ Nagios

Introduction to DevOps

- ❖ What is Software Development
- ❖ Software Development Life Cycle
- ❖ Traditional Models for SDLC
- ❖ Why DevOps?
- ❖ What is DevOps?
- ❖ DevOps Lifecycle
- ❖ DevOps Tools

Continuous Testing

- ❖ What is Continuous Testing?
- ❖ What is Maven?
- ❖ Running Test Cases on Chromium Web Driver
- ❖ What is Headless Mode?

DevOps Syllabus

Hands-on Exercise –

- ❖ Using Maven to import dependencies in Eclipse
- ❖ Implementing a headless test using Chrome WebDriver
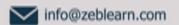
Continuous Integration using Jenkins

- ❖ Introduction to Continuous Integration
- ❖ Jenkins Master Slave Architecture
- ❖ Understanding CI/CD Pipelines
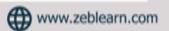- ❖ Creating an end to end automated CI/CD Pipeline

Hands-on Exercise –

- ❖ Creating a Jenkins Master Slave on AWS
- ❖ Installing Plug-ins in Jenkins
- ❖ Creating Jenkins Builds
- ❖ Creating Scheduled Builds
- ❖ Triggering Jobs using Git Web Hooks
- ❖ Using the Pipeline Plugin In Jenkins

Software Version Control

- ❖ What is Version Control
- ❖ Types of Version Control System
- ❖ Introduction to SVN
- ❖ Introduction to Git
- ❖ Git Lifecycle
- ❖ Common Git Commands
- ❖ Working with Branches in Git
- ❖ Merging Branches
- ❖ Resolving Merge Conflicts
- ❖ Git Workflow
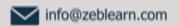
DevOps Syllabus

Hands-on Exercise –

- ❖ Git Life cycle Commands
- ❖ Pushing Code to Github
- ❖ Stashing Code in git
- ❖ Creating, Deleting Git Branches
- ❖ Reverting a Push to GitHub
- ❖ Merging branches using git merge
- ❖ Merging branches using git rebase.
- ❖ Resolving merge conflicts using git merge tool

Continuous Deployment: Containerization with Docker

- ❖ Introduction to Docker
- ❖ Understanding Docker Lifecycle
- ❖ Components of Docker Ecosystem
- ❖ Common Docker Operations
- ❖ Creating a DockerHub Account
- ❖ Committing changes in a Container
- ❖ Pushing a Container Image to DockerHub
- ❖ Creating Custom Docker Images using Dockerfile

Hands-on Exercise –

- ❖ Common Docker Operations
- ❖ Creating a DockerHub Account
- ❖ Committing Changes to a Container
- ❖ Pushing container to DockerHub
- ❖ Creating Local Image Repository
- ❖ Building an Image using Dockerfile

DevOps Syllabus

Containerization with Docker: Ecosystem and Networking

- ❖ What are Docker Volumes
- ❖ Deploying a Multi-Tier Application using Docker Network
- ❖ Using Docker Compose to deploy containers
- ❖ What is Container Orchestration
- ❖ Container Orchestration Tools
- ❖ Introduction to Docker Swarm
- ❖ Deploying a 2-Node Cluster using Docker Swarm

Hands-on Exercise –

- ❖ Creating Docker Volumes
- ❖ Using Docker Compose to deploy multiple containers
- ❖ Deploying a Multi Node Cluster using Docker Swarm
- ❖ Deploying a multi-service app on Docker Swarm

Configuration Management using Puppet

- ❖ Need of Configuration Management
- ❖ Configuration Management Tools
- ❖ What is Puppet
- ❖ Puppet Architecture
- ❖ Setting up Master Slave using Puppet
- ❖ Puppet Manifests
- ❖ Puppet Modules
- ❖ Applying configuration using Puppet
- ❖ Puppet File Server

DevOps Syllabus

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DevOps Syllabus
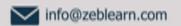
Hands-on Exercise –

- ❖ Setting up Master Slave on AWS
- ❖ Testing Connection of nodes with Puppet
- ❖ Creating a Manifest
- ❖ Deploying Manifest on Node
- ❖ Creating a Module
- ❖ Deploying sample software on nodes using Puppet Modules and Manifests
- ❖ Implementing a File Server Module on Puppet

Configuration Management using Ansible

- ❖ What is Ansible?
- ❖ Ansible vs Puppet
- ❖ Ansible Architecture
- ❖ Setting up Master Slave using Ansible
- ❖ Ansible Playbook
- ❖ Ansible Roles
- ❖ Applying configuration using Ansible

Hands-on Exercise –

- ❖ Installing Ansible on AWS
- ❖ Creating a Playbook using YAML
- ❖ Creating an Ansible Role
- ❖ Using Roles in Playbook

DevOps Syllabus

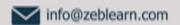## Continuous Orchestration using Kubernetes

- ❖ Introduction to Kubernetes
- ❖ Docker Swarm vs Kubernetes
- ❖ Kubernetes Architecture
- ❖ Deploying Kubernetes using Kubeadms
- ❖ Alternate ways of deploying Kubernetes
- ❖ YAML Files
- ❖ Creating a Deployment in Kubernetes using YAML
- ❖ Services in Kubernetes
- ❖ Ingress in Kubernetes
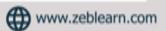- ❖ Case Study – Kubernetes Architecture

Hands-on Exercise –

- ❖ Setting up Kubernetes using kubeadm
- ❖ Installing Kubernetes using kops and GCK
- ❖ Creating a Deployment
- ❖ Creating Services
- ❖ Creating an Ingress
- ❖ Demonstrating the use of Ingress, services and deployments together

Continuous Monitoring using Nagios

- ❖ What is Continuous Monitoring
- ❖ Introduction to Nagios
- ❖ Nagios Architecture
- ❖ Monitoring Services in Nagios
- ❖ What are NRPE Plugins
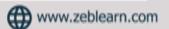- ❖ Monitoring System Info using NRPE plugins

DevOps Syllabus

Hands-on Exercise –

- ❖ Installing Nagios
- ❖ Monitoring of different servers using Nagios

Terraform Modules & Workspaces

- ❖ What is Infrastructure as a code
- ❖ Iac vs Configuration Management
- ❖ Introduction to Terraform
- ❖ Installing Terraform on AWS
- ❖ Basic Operations in terraform
- ❖ (init, plan, apply, destroy)
- ❖ Terraform Code Basics
- ❖ Deploying and end-to-end architecture on AWS using Terraform

Thanks you

Now or Never