

# AWS DevOps Course Syllabus

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## AWS

### Account Creation

- Basic overview of AWS console, regions and the billing dashboard
- Walk through the services pane in AWS Console
- AWS Support Packages and Best Practices

### EC2

- Introduction to EC2
- Provisioning and connection to an EC2 instance
- Creating Snapshot and AMIs for backup
- Installing and accessing apache web server on EC2
- Understanding Elastic Load Balancer and their types
- Configuring Application Load Balancer for high availability
- Understanding ssh connection scenarios
- Create launch configuration and ASG Scaling Policies
- Testing of Auto Scaling using CloudWatch Metrics

### S3

- Introduction to storage on cloud
- S3 storage tiers
- Using S3 capabilities like versioning, Cross-Region Replication, Static website hosting, transfer acceleration and S3 Life Cycle Policy
- Working with CORS and S3 Bucket Policy

### IAM

- Creating users, groups and roles in IAM
- Creating custom policies for granular permissions
- Creating service role

- Cross account access using AWS STS

## VPC

- Basic networking concepts
- Understanding the default VPC
- Understanding the core components of VPC like Subnets, Route Tables, Internet Gateway, NAT
- Gateway, NACL, Security Groups and VPC Flow Logs
- Creating own Custom VPC
- Creating VPC endpoint for S3
- VPC Peering

## CloudWatch and SNS

- Creating cloudwatch Dashboards
- Creating and Monitoring Custom CloudWatch Metrics
- Configuring cloudwatch rules for Events and Alarms
- Sample queries using cloudwatch insights.
- Introduction to SNS.
- Configuring SNS Topic and Subscribers.

## CloudTrail

- Understanding AWS Account Auditing using Cloudtrail
- Searching Event history
- Creating a trail

## RDS

- Mysql Installation on EC2
- Introduction to managed services
- Configuring and creating a private RDS instance
- RDS Connection from EC2 instance
- Create an restore using a manual snapshot
- Creating a Read Replica

## Glue and Athena

- Introduction to Serverless querying engine
- Creating a table in Athena to query S3 data
- Using glue crawler to scan the schema
- Creating partitions in Athena table
- Querying CloudTrail Logs using Athena

## AWS Systems Manager

- Creating Managed instances
- Using Session manager
- Use of SSM Patch Manager and Patch baseline
- Using run command using SSM

## AWS CLI Tool

- Using AWS-CLI to access AWS Resources
- Control and manage multiple AWS services from the command line.
- Filtering AWS CLI Output.

## Lambda and API Gateway

- Understanding Serverless Computing with AWS Lambda
- Working of AWS Lambda Environment Variables, SSM Parameter Store
- Custom Email Notification using AWS Lambda and SNS
- API Gateway Concepts.

- Integrating API Gateway with Lambda

## Day to day activities

- Ticket management
- Alert monitoring
- Frequent requests
- Administration best practices

## Python

- Strings, List, Tuples, Dictionaries, Conditional, Loops, Functions
- Reading configuration files using Python
- Installation of Python Libraries
- Working with boto3 library to interact with AWS Services using Python

## Linux

- Introduction to Linux and its Distributions
- Users and File Management
- Files, Processes, Text Processing
- Scheduling Tasks using cron
- Linux Package Managers
- Linux Networking and Firewall.
- Installation, configuration of nginx Webserver and MySql Database
- TLS/SSL configuration for Web servers
- Linux Shell Scripting
- Linux storage attachment with EBS

## DevOps

### Infrastructure As a Code

- YAML Basics
- Creating AWS Resources with CloudFormation Stacks using YAML Templates
- CloudFormation Components : Parameters, Resources, Mappings, Conditions, Outputs, Intrinsic Functions
- CloudFormation Create/Update/Delete Stacks and Stack Drift Detection Scenarios
- CloudFormation Export and Import Stack
- IAC Comparison with CloudFormation and TerraForm.

### Source Control Management

#### Git and Github

- Types of Version Control Systems
- Git Components and Repository
- Working with Branches in Git
- Branching and Merging Strategies in Git, Resolving Merge Conflicts
- Github Pull Request
- Working with Github

### Cloud Managed CICD

#### CodeCommit

- Working with AWS CodeCommit for Version Control
- Creating CodeCommit Repositories
- IAM Policies to securing Repositories and Branches in AWS CodeCommit

#### CodeBuild

- CodeBuild Project Configurations
- CodeBuild Environment variables, Parameter Store and writing buildspec.yml files
- CodeBuild Artifacts on S3
- Automation of Infrastructure creation using CodeBuild and CloudFormation

## **CodeDeploy**

- Creating CodeDeploy Application and Deployment Groups
- Deployment configuration using appspec.yml
- Application Deployment as per SDLC Environments

## **CodePipeline**

- Orchestration of AWS CodeCommit, CodeBuild, CodeDeploy with CodePipeline
- CodePipeline Stages, Actions and Manual Approvals
- CodePipeline Artifact Generation and Pipeline Execution.

## **Open Source DevOps with Ansible and Jenkins**

### **Ansible**

- Installation and configuration of Ansible.
- Ansible Inventory Setup for execution of Ad-Hoc Commands
- Ansible Playbooks, Roles, Jinja Templates Execution.

### **Jenkins**

- Installation and configuration of Jenkins and Jenkins Plugins.
- Jenkins FreeStyle Job and Pipeline declarative pipelines as code.
- Jenkins Environment Variables, Parameters
- Github Integration with Jenkins Jobs for Build Executions
- Setup and Configure Jenkins Jobs with Maven Build for Tomcat Server Deployment.
- Jenkins Access Control and Authorization

## **Container Platform**

### **Docker**

- Understanding Docker Container Lifecycle and Components of Docker Ecosystem
- Working with Docker images and containers
- Working with Dockerfile
- Working with Docker Registry like DockerHub and AWS ECR
- Continuous Integration Pipeline to create Docker Images and pushing it to AWS ECR
- Docker Volumes.

### **Kubernetes**

- Overview of Kubernetes Architecture and Components for Container Orchestration
- Understanding Kubernetes concepts like Pods, ReplicaSets, Deployments.
- Understanding of Kubernetes setup using various options
- Creating deployments in Kubernetes using YAML files
- Setup Minikube Cluster on a Virtual Machine