**LINUX Basics:**
- Unix and linux difference
- Linux File system structure
- Basic linux/unix commands
- Changing file permissions and ownership
- Types of links soft and hard link
- Filter commands
- Simple filter and advance filter commands
- Start and stop services
- Find and kill the process with id and name
- Package installation using RPM and YUM

**Introduction to Devops**
- Define Devops
- What is Devops
- SDLC models,Lean,ITIL,Agile
- Why Devops?
- History of Devops
- Devops Stakeholders
- Devops Goals
- Important terminology
- Devops perspective
- Devops and Agile
- Devops Tools
- Configuration management
- Continuous Integration and Deployment

**Introduction to Cloud computing**
- What is cloud computing
- Characteristics of cloud computing
- Cloud implementation models
- Cloud service models
- Advantages of cloud computing
- Concerns of cloud computing

**GIT: Version Control**
- Introduction
  - What is Git
  - About Version Control System and Types
  - Difference between CVCS and DVCS
  - A short history of GIT
  - GIT Basics
  - GIT Command Line
- Installing Git
  - Installing on Linux
  - Installing on Windows
  - Initial setup
- Git Essentials
  - Creating repository
  - Cloning, check-in and committing
  - Fetch pull and remote

- o Branching
- o Creating the Branches, switching the branches, merging the branches.
- GitHub
  - o Creating GitHub account and repositories
  - o Push code from local to remote repos
  - o Pull code from remote repo to local repos
  - o User collaboration and permissions on GitHub Repo
- Git-ssh
  - o Generate public key and adding to GitHub
  - o Check-in the code without credential from local to remote
- Git stash
  - o Stash introduction.
  - o Stash apply and remove
- Git PR(pull requests)
  - o Create pull request
  - o Review and merge PR
- Git differences
  - o Pull vs fetch
  - o Merge vs rebase
  - o Revert vs reset

## AWS:

- o Creating AWS account
- o Free tier Eligible services
- o Understanding  AWS Regions and availability zones

- EC2 ( Elastic Cloud Comput)

  - o About EC2  and types , Pricing
  - o EIP ( Elastic IP address), Allocating, associating , releasing
  - o Launch windows and Linux Instances in AWS
  - o Connecting windows and Linux instances from windows desktop and Linux machines

- S3 ( Simple Storage Service)

  - o About  AWS Storage services, EBS and S3
  - o Creating S3 Buckets and putting objects in bucket
  - o Discussion about Bucket Properties
  - o S3 Pricing
  - o About S3 glecier

- EBS ( Elastic Block Storage)

  - o Types of EBS Volumes
  - o Creation, attaching and Detaching volumes

- ELB ( Elastic Load Balancer)

  - o Understanding the load balancing
  - o Configuring ELB and adding the webservers under ELB

- Auto Scaling

  - Types of Scaling ( Horizontal and Vertical)
  - Configuring Launch Configuration
  - Creating and defining the auto scaling group policy

- IAM ( Identity Access Management)

  - Understanding of  AWS Security using  IAM
  - Definition of Roles, policies and Groups
  - Creating IAM Users and managing password policies

- RDS ( Relational Database server)

  - About RDS and available RDS Engines in AWS
  - Configuring MYSQL RDS service
  - Connecting EC2 Instance to RDS Instance

- LAMBDA

  - About Lambda
  - Understanding Lambda function and terminology
  - Sample Lambda function creation
  - Deploy microservices using lambda

- VPC (Virtual Private cloud)

  - Understanding basic network concepts like ip, subnet, NAT,
  - VPC terminology Private Subnet, Public Subnet, Internet Gateway,NACL
  - Configuring public and private subnet VPC with NAT Gateway

## Ansible for configuration management
- What is Ansible?
  - How Ansible works?
  - Ansible Architecture?
  - Ansible terminology and about Playbooks
- Installation and Configuration
  - Installing Ansible on Linux(Redhat family and Debian family(ubuntu))
  - Ansible client and server configuration
  - Writing playbooks using YAML
  - Deploy webapplications using Ansible
  - Ansible roles and it's structure& Ansible galaxy
    - Tasks
    - Files
    - Templates
    - Meta
    - Vars
    - Defaults
    - Tests
    - Handlers
  - What is host inventory files

- What is static inventory file
- What is dynamic inventory file
- Ansible variables(Global and local variables)
- Ansible templates using jinja2
- Ansible modules
- Debug module
- Ansible conditional statements
- Ansible loops
- Ansible tasks
- Ansible adhoc commands
- Ansible vault
- Ansible log configuration
- Provisioning ec2 instance using Ansible playbook
- Ansible with docker
- What is Ansible play

## Jenkins – Continuous Integration

- Introduction.
  - Understanding continuous integration
  - Introduction about Jenkins
  - Build Cycle
  - Jenkins Architecture
- **Installation**
  - Obtaining and installing Jenkins
  - Installing and configuring Jenkins using WAR and RPM
  - Java installation and configuration
  - Maven Installation
  - Exploring Jenkins Dashboard.
- **Jobs**
  - Creating Jobs
  - Running the Jobs
  - Setting up the global environments for Jobs
  - Adding and updating Plugins
  - Disabling and deleting jobs
- **Build Deployments**
  - Understanding Deployment.
  - Tomcat installation and configuration
- **Securing Jenkins**
  - Authentication
  - Jenkins Plugin
  - Authorization
  - Confidentiality
  - Creating users
  - Best Practices for Jenkins
- **Jenkins integration with**
  - Artifactory
  - Tomcat
  - SonarQube
- **Pipeline (Jenkins File)**
  - Understanding pipeline

- o Parameterized Jenkinsfile
- o Understanding Groovy DSL
- o Various examples

- **Artifactory**
  - o Introduction
  - o Installation and configuration
  - o Repository types and setup
  - o Integration with Jenkins
- **SonarQube**
  - o Introduction
  - o Installation and configuration
  - o Integration with Jenkins

# Terraform– (IAC)
- **Introduction**
  - o What is terraform
- **Core concepts**
  - o Provider
  - o Provisioner, Resource, module
  - o State, Data source, output values
  - o Plan, apply, destroy
  - o Terraform lifecycle

## Terraform use cases
- o Provision Ec2 instance using terraform
- o Provision VPC, other AWS resource and Docker container
- o Create azure VM using terraform

## Variables:
- o Local variable
- o Input variables

## Module:
- o Root Module
- o Local module
- o Remote module
- o Writing modules and examples

## State:
- o State Format
- o Locking

## Workspace:
- o Using Workspace

# Docker– (Containers)
- **Introduction**
  - o What is a Docker
  - o Use case of Docker
  - o Platforms for Docker
  - o Dockers vs. Virtualization
- **Architecture**
  - o Docker Architecture.

  - o Understanding the Docker components
- **Installation**
  - o Installing Docker on Linux.
  - o Understanding Installation of Docker on windows.
  - o Some Docker commands.
  - o Provisioning
- **Docker Hub**
  - o Downloading Docker images.
  - o Uploading the images in Docker Registry and AWS ECS
  - o Understanding the containers
  - o Running commands in container.
  - o Running multiple containers.
- **Custom images**
  - o Creating a custom image.
  - o Running a container from the custom image.
  - o Publishing the custom image.
- **Docker Networking**
  - o Accessing containers
  - o Linking containers
  - o Exposing container ports
  - o Container Routing
- **Docker Compose**
  - o Installing The Docker compose
  - o Terminology in Docker compose
  - o Build word press site using Docker compose
- **Docker SSH**
  - o Connecting docker containers using ssh

- **Docker with wordpress press Project**
  - o Deploy wordpress application on docker containers

- **Docker with web application**
  - o Deploy webapplication application on docker containers
- **Docker Hub**
  - o Docker hub creation and managing images on Docker Hub
  - o Docker Repository and registry

## Kubernetes
- **Introduction**
  - o Why and what is kubernetes
  - o Kubernetes Objects
  - o Kubernetes Architecture
  - o Pods
  - o Service
  - o Volume
  - o Namespace
  - o ReplicaSet
  - o Deployment
  - o StatefulSet
  - o DaemonSet
  - o Job

- **Create a Kubernetes Cluster**
  - On AWS using Kubeadm
  - On Azure using AKS
  - On GCP using GKE
- **Create Minikube cluster**
- **Using kubectl to Create a Deployment**
- **Using a Service to Expose Your App**
- **Scale Your Apps stateless and stateful**
- **Using kubeadm to Create a Cluster**
- **Access application on Kubernetes cluster**
  - Using service Cluster-IP
  - Using Service Node Port
  - Using service Load balancer
- **Helm**
  - Helm Introduction and installation
  - Helm concepts
  - Helm architecture and components
  - Helm charts
  - Helm chart preparation
  - Helm chart.yml file and explanation
- **Service mesh**
  - Introduction and microservice concepts
- **Istio**
  - Why we Istio
  - Core feature of Istio
  - Install with Helm
  - Tasks and examples

## ELK
- Introduction
- What is ELK?
- ELK Installation
- ElasticSearch
- Logstash
- Kibana
- Filebeat
- Configuring Logstash and  Kibana
- Shipping logs from clients servsr

## Maven for DevOps
- Install Apache Maven successfully
- Understand Maven dependencies and control Maven classpaths
- Install plugins, manage plugins with a parent POM, and find available plugins
- Comprehend Maven build properties
- Create a project website
- Release Maven artifacts
- Build a website for multi-module project
- Build a simple installer and run functional tests
- Take advantage of popular Maven tricks and patterns

**Real time End to End Projects: 4**
- CI/CD using Github, Jenkins, ECR, ECS, Cloud Formation and IAM
- Deploy application with CI/CD using GitHub, Jenkinsfile, Docker Hub and SonarQube
- Provision infrastructure on AWS using Jenkins and Terraform.
- Containerization of application using Docker, Kubernetes and Helm

**Real time Procedure**
**Agile Process**
**DevOps vs Agile**
**ITIL introduction**
**Resume Preparation and Interview questions**