⚙️🚀 DevOps Syllabus || Tech Titans Academy.

1. Introduction
   - Introduction to DevOps
   - DevOps Principles in detail.
   - DevOps Engineer Skills in the market.
   - Market trend of DevOps.
   - DevOps Technical Challenges.
   - Tools we use in DevOps.
   - DevOps on Cloud.

2. Essentials of Cloud Technology.?
   - Cloud providers - An overview
     - AWS.
     - GCP.
     - Azure.
     - IBM Cloud.
   - Cloud deployment architecture.
   - Cloud Service Models?
     i. **IaaS** (Infrastructure as a Service) - Storage, Storage, N/W, AWS EC2, Azure VM
     ii. **PaaS** (Platform as a Service) - Red Hat OpenShift, Salesforce Platform and Jira.
     iii. **SaaS** (Software as a Service) - Gmail, Salesforce, Office 365, Google Sheet, Google Words, Online Sketch.

3. Linux Administrations.
   - What is Linux and RHEL?
     - Navigating the Linux filesystem
     - Using Bash shell and command-line tools.
   - Essentials Commands:
     - File and directory management (`ls` , `cp` , `mv` , `rm`)
     - Viewing file content (`cat` , `less` , `head` , `tail`)
     - File permissions and ownership (`chmod` , `chown`)
     - File linking and archiving (`tar` , `gzip` , `zip`)
   - User & Group Administrations.

        - Adding/deleting users and groups
        - Modifying user permissions
        - Understanding `/etc/passwd`, `/etc/shadow`, `/etc/group`
        - Sudo access and privilege escalation
    - Software Management in Linux.
    - Networking Concepts in Linux.
    - Security.
    - System Monitoring and Logs.
4. GIT - A Version controlling tool.
    - Knowing about Version control.
    - GitHub User Interface Introduction.
    - Exploring all the options.
    - How to setup GIT.
    - Installing Git.
    - First-Time Git Setup.
    - Getting a Git Repository.
    - Working with various commands in GIT.
    - Recording Changes to the Repository.
    - How to check the Status of Your Files.
    - How to track New Files.
    - Staging our modified files.
    - Ignoring Files from GIT.
    - Viewing Your Unstaged and Staged Changes.
    - Undoing things, viewing commit history.
    - Working with Remotes. (Add/remove/delete/inspect remote).
    - Git cheat Sheet.

5. Docker & Containerization.
    - Introduction to Containerization.
        - What is containerization?
        - History and evolution of virtualization
        - Containers vs Virtual Machines
        - Benefits of using containers.
    - Getting Started with Docker.
        - What is Docker?
        - Installing Docker on Windows/Mac/Linux
        - Docker architecture: Engine, Daemon, CLI, Images, Containers
        - Running your first container (`hello-world`)
    - Working with Docker Images.
        - Pulling images from Docker Hub.
        - Listing and removing images.

    - Difference between containers and images.
    - Understanding image layers.
    - Use `docker pull`, `docker images`, `docker rmi`
    - Run a web server container (`nginx`, `httpd`, or `alpine`)
- Managing Containers.
    - Running containers interactively and in detached mode
    - Container lifecycle
    - Viewing logs
    - Executing commands inside containers.
    - Use `docker run`, `start`, `stop`, `rm`, `logs`, `exec`, `ps`, `inspect`
- Volumes & Persistence
    - What is a volume?
    - Named volumes vs bind mounts
    - Sharing data between host and container.
    - Create and mount volumes - Persist database data using volumes (e.g., with `postgres`)
- Docker Networking:
    - Bridge, Host, None, and Custom networks
    - Linking containers and exposing ports
- Dockerfile & Custom Images:
    - What is a Dockerfile?
    - Basic Dockerfile instructions: `FROM`, `RUN`, `COPY`, `CMD`, `EXPOSE`
    - Image build process.
    - Write a simple Dockerfile for a Python or Node.js app
    - Build and tag the image with `docker build`
- Docker Compose:
    - What is Docker Compose?
    - YAML syntax
    - Services, networks, volumes in Compose.
    - Write a `docker-compose.yml` for a basic 2-service app (e.g., Python app + Redis)
    - Use `docker-compose up`, `down`, `logs`
- Docker Hub & Image Registries.
    - Tagging and pushing images
    - Private vs public repositories
    - Best practices for naming and tagging

6. Kubernetes and Orchestrations.
    - Introduction to Kubernetes.
    - Kubernetes Architecture.
        - Control Plane vs Node components

        - kube-apiserver, kubelet, kube-scheduler, etcd, controller-manager
        - Pods, Nodes, and Clusters
        - Declarative vs imperative management.
    - Setting Up a Kubernetes Environment.
        - Minikube, kind, Docker Desktop, or Kubernetes on cloud (GKE/EKS/AKS)
        - Installing `kubectl`
        - Starting a local cluster (Minikube)
    - Pods and Deployments.
        - What is a Pod?
        - What is a Deployment?
        - YAML manifests: structure and syntax
        - Scaling Deployments.
    - Volumes & Persistence.
        - Volumes vs PersistentVolumes (PV) and PersistentVolumeClaims (PVC)
        - Storage classes and dynamic provisioning.
    - Configuration Management.
        - ConfigMaps and Secrets
        - Environment variables vs mounted volumes
        - Managing sensitive data.
    - Services & Networking.
        - What is a Service?
        - ClusterIP vs NodePort vs LoadBalancer
        - DNS in Kubernetes
        - Service discovery.

7. Ansible.
    - Introducing Ansible - A configuration management tool.
        - Basics / What Will Be Installed.
        - Understanding Ansible architecture.
        - Control Machine Requirements.
        - Managed Node Requirements.
    - Inventory.
        - Hosts and Groups.
        - Host Variables.
        - Group Variables.
    - Learn various ansible Modules
        - How to use adhoc commands.
        - File Transfer.
        - Managing Packages.
        - Users and Groups.
        - Deploying From Source Control.

    - Managing Services.
- Introduction to YAML script
    - Playbook
    - About Playbooks
    - Playbook Language Example - YAML
    - How to Write Playbooks
    - Tasks in Playbooks
    - Understanding about various tasks in playbook
    - Introduction to Handlers and variables
    - Learn about using handlers, variables in the playbook
    - Become (Privilege Escalation)
- Roles
    - Role Directory Structure.
    - Using Roles
    - Role Duplication and Execution
    - Role Default Variables
    - Role Dependencies
    - Role Search Path
    - Ansible Galaxy
- Including and Importing
    - Includes vs. Imports
    - Importing Playbooks
    - Including and Importing Task Files.
    - Including and Importing Roles.
- Developing simple Ansible scripts.

8. Jenkins [CI-CD].
    - Essentials of Continuous Integration.
    - An example scenario where CI is used.
    - Know about Jenkins and its architecture in detail.
    - Jenkins tool Management in detail.
    - Know about User management in Jenkins.
    - Authentication.
        - Jenkins own database user creation.
        - Options to enable integration with LDAP.
    - Authorization.
        - Matrix based authorization.
        - Project based authorization.
    - Overview of Maven.
        - Maven project structure.
        - Maven plugins.

    - Project Object Model (POM) - fundamental unit of work in Maven project.
    - Maven build lifecycle.
    - Adding external dependencies to maven pom.xml.
    - Maven build and test project.
- Creating jobs and automatic build settings.
    - What is Jenkins Pipeline?
    - Why Pipeline?
    - Integration with GIT.
    - How to enable project based authorization for a job.
    - Triggering automated build.
    - Maven job setup.
    - Know about post build options for jobs like notifications, trigger another build, publishing reports, etc.
    - Adding a slave node to Jenkins.
    - Building Delivery Pipeline.
    - Notification settings in Jenkins.
    - Plugin management in Jenkins.

NOTE: *The syllabus is subject to change based on the latest updates or as per requirements. Content may be added or removed as deemed necessary to ensure relevance and effectiveness of the course.*

Training By:- TechTitans Academy

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