Week 1: Introduction to DevOps

Start by building a solid foundation in DevOps principles and practices, setting the stage for continuous integration and continuous delivery (CI/CD).

Key Training Components:

- **What is DevOps?**: Understand the cultural shift and practices that bridge development and operations.
- **DevOps Principles**: Learn about automation, continuous feedback, and monitoring to enhance software development cycles.
- **Collaboration and Communication**: Best practices for effective teamwork between developers, operations, and stakeholders.
- **DevOps Lifecycle**: Dive into the phases of the DevOps lifecycle: Plan, Develop, Build, Test, Release, Deploy, Operate, and Monitor.

Week 2: Linux Basics

Get familiar with Linux command-line tools, essential for DevOps workflows, particularly in cloud and server environments.

Key Training Components:

- **Command Line Basics**: Understand file management (`ls`, `cp`, `mv`, `rm`, `cat`), and process management (`ps`, `top`, `kill`).
- **Permissions and Ownership**: Learn how to manage file and directory permissions using `chmod` and `chown`.
- **Networking**: Basics of networking using `ping`, `netstat`, and `curl` for troubleshooting and connectivity.
- **Scripting**: Automate tasks with Bash scripting, loops, and conditional statements.

Week 3: Version Control with Git

Master the core concepts of version control, which is fundamental to DevOps workflows.

Key Training Components:

- **Core Concepts**: Learn how to manage code repositories, branches, commits, and merges using Git.
- **Collaboration**: Use Git for collaborative development with pull requests and code reviews.
- **Advanced Git**: Explore advanced Git operations such as merging, resolving conflicts.

Week 4: Cloud Platforms (AWS)

Dive into cloud platforms, starting with AWS, a key component in DevOps for provisioning and managing infrastructure.

Key Training Components:

- **Core Concepts**: Learn about essential AWS services like EC2 (compute), S3 (storage), and VPC (networking).

- **Hands-On**: Use the AWS Console to provision EC2 instances, configure S3 buckets, create VPCs, security groups, and load balancers.

Week 5: Continuous Integration/Continuous Delivery (CI/CD)

Explore CI/CD pipelines and the tools used to automate code integration, testing, and deployment.

Key Training Components:

- **CI/CD Concepts**: Understand how CI/CD accelerates development workflows by automating integration and deployment processes.
- **Pipeline Design**: Learn the steps for designing a CI/CD pipeline.
- **Tools Comparison**: Compare Jenkins, GitHub Actions, and other CI/CD tools.
- **Hands-On**: Set up and automate a pipeline for CI/CD using Jenkins and GitHub Actions.

Week 6: Infrastructure as Code (IaC)

Learn the essentials of Infrastructure as Code (IaC) to automate cloud infrastructure provisioning and management.

Key Training Components:

- **Core Tools**: Explore Terraform for provisioning cloud resources.
- **Best Practices**: Learn about modularization, state management, and secrets management.
- **Hands-On**: Provision cloud infrastructure using Terraform.

Week 7: Containerization with Docker

Understand containerization and its role in DevOps, particularly for scaling applications and environments.

Key Training Components:

- **Core Concepts**: Learn the difference between containers and virtual machines. Understand Docker's architecture (images, containers, volumes).
- **Hands-On**: Build and manage Docker images, and use Docker Compose for multi-container applications.

Week 8: Orchestration with Kubernetes

Learn how to orchestrate containerized applications using Kubernetes, a critical skill in modern DevOps environments.

Key Training Components:

- **Core Concepts**: Understand Kubernetes architecture, including nodes, pods, deployments, and services.
- **Scaling and Auto-Healing**: Learn how Kubernetes manages scalability and fault tolerance.
- **Hands-On**: Deploy applications on Kubernetes clusters and manage them using Helm charts.

Week 9: Configuration Management with Ansible

Automate and manage infrastructure configurations efficiently using Ansible.

Key Training Components:

- **Core Concepts**: Learn about Ansible's automation capabilities and write playbooks to manage infrastructure.
- **Idempotency**: Understand the concept of idempotency in configuration management.
- **Hands-On**: Write Ansible playbooks and configure servers for deployment.

Week 10: Monitoring and Logging

Understand the importance of monitoring and logging in DevOps, with tools like Prometheus, Grafana, and the ELK stack.

Key Training Components:

- **Core Tools**: Learn how to monitor system performance using Prometheus, visualize metrics with Grafana, and analyze logs with the ELK stack.
- **Hands-On**: Set up monitoring dashboards and configure log aggregation using Kibana.

Week 11: Capstone Project Development

Apply everything you've learned by completing a real-world DevOps project.

Key Training Components:

- **Project Planning**: Design and outline your capstone project, integrating multiple DevOps tools and practices.
- **Implementation**: Build and test your project, focusing on CI/CD, IaC, containerization, and orchestration.
- **Collaboration**: Work in teams to refine and improve the project.
- **Final Presentation**: Present your project, demonstrating its scalability, security, and DevOps integration.