🛠 DevOps Bootcamp – Git, Terraform, Ansible (4 Days x 8 Hours)

Day 1: Git, GitHub & GitOps (4 Hours) + Terraform Introduction (4 Hours)

Module 1: Git, GitHub & GitOps (4 Hours)

- **1.1 Git Basics & Local Workflows**
    - Init, Clone, Add, Commit, Push, Pull
    - Branching and merging
    - Hands-on: Git workflow with branching and merge conflict resolution
- ***1.2 GitHub Collaboration***
    - Forking, Pull Requests (PR), Code Reviews
    - .gitignore, Git tags, Releases
- ***1.3 GitOps Fundamentals***
    - What is GitOps?
    - Git as a source of truth for infra/config
    - GitOps in practice with Terraform/Ansible
- **Hands-on:** Setup GitHub repo, push infra config, simulate GitOps workflow trigger

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Module 2: Terraform Basics (4 Hours)

- **2.1 Introduction to Terraform**
    - IaC Concepts, Terraform workflow
    - Providers, Resources, State file overview
- ***2.2 Writing Your First Terraform Config***
    - HCL Syntax
    - Resource block (e.g., VM, storage)
    - Variables and Outputs
    - Hands-on: Create a VM or simple infra

Day 2: Terraform Deep Dive (8 Hours)

Module 3: Terraform Intermediate to Advanced

- **3.1 State Management**
    - Local vs remote backend (e.g., S3/Azure/GCP)
    - Locking and consistency
    - Terraform state commands
    - Hands-on: Configure remote backend
- ***3.2 Terraform CLI and Workspaces***
    - plan, apply, destroy
    - refresh, taint
    - Workspaces for multi-env
- ***3.3 Modules and Reusability***
    - Creating and using modules
    - Inputs/outputs
    - Module best practices
    - Hands-on: Modularize existing infra config
- ***3.4 Data Sources & Dependencies***
    - Using datablocks
    - Resource dependency resolution
- ***3.5 Provisioners and External Providers***
    - local-exec, remote-exec
    - file provisioner
    - Dynamic blocks and complex structures
- **Hands-on Lab:** Full infra deployment using modules and remote backend

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Day 3: Terraform Real-world Usage & Ansible Basics (8 Hours)

Module 4: Terraform Advanced & Real-World Integration (4 Hours)

- **4.1 Terraform Cloud & Workflows**
    - Terraform Cloud/Enterprise overview
    - Remote execution & VCS integration (GitHub)

- ***4.2 Best Practices***
  - Folder structure, env separation
  - Secrets management (Vault, SSM, environment vars)

- ***4.3 CI/CD Integration***
  - Terraform with GitHub Actions/GitLab CI
  - Hands-on: Simulate CI/CD with Terraform Plan/Apply
- **Hands-on Lab:** Git commit → Terraform apply with GitHub Actions (mocked)

Module 5: Ansible Essentials (4 Hours)

- **5.1 Introduction to Ansible**
  - Agentless model
  - Inventory (static/dynamic)
  - Ad-hoc commands

- ***5.2 Writing Playbooks***
  - Tasks, Modules, YAML structure
  - Variables, Facts, Handlers

- ***5.3 Templates & Conditionals***
  - Jinja2 templates
  - Loops and when conditions

- **Hands-on:** Write playbooks to install and configure Apache/nginx

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Day 4: Ansible Deep Dive (8 Hours)

Module 6: Ansible Advanced Use (8 Hours)

- **6.1 Roles & Reusability**
  - Creating and structuring roles
  - Role dependencies and defaults

- ***6.2 Secrets and Secure Configuration***

- Ansible Vault (encrypting secrets)
- Group vars and host vars
- Inventory best practices

- ***6.3 Error Handling, Tags, and Debugging***
    - Block/rescue, assert, fail
    - Using tagsfor selective runs
    - Logging and verbosity levels

- ***6.4 Dynamic Inventory***
    - AWS EC2/GCP/Azure plugin
    - Custom scripts

- ***6.5 End-to-End Integration Lab***
    - Use Terraform to provision VM
    - Use Ansible to configure it
    - Simulate GitOps with GitHub commit triggering config

✅**Outcomes:**

- GitOps-ready DevOps engineer
- Hands-on Terraform (IaC) expert
- Ansible automation pro for real-world infra config