

Apr 26, 2025

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# Master DeVops

Live + Placement

Dusra College

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# INTRODUCTION TO DEVOPS

## Week 1

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### Overview

- Understanding DevOps, its evolution, and industry adoption
- Key DevOps principles: CI/CD, Infrastructure as Code, Automation
- DevOps tools overview: Git, Docker, Kubernetes, Jenkins, Terraform, Ansible
- Importance of version control and collaboration using GitHub/GitLab
- Introduction to CI/CD pipelines and their role in software development

### Take-Home Task:

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- Create a GitHub repository and push your first project
- Explore and document different DevOps tools

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# Linux Fundamentals and Shell Scripting for DevOps

## Week 2

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### Overview

- Essential Linux commands and file system navigation
- User management, permissions, and process control
- Bash scripting basics for automation
- Working with environment variables and cron jobs

### Take-Home Task:

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- Write a shell script to automate repetitive tasks (e.g., log cleanup, backup)
- Set up a scheduled cron job for automated execution

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# Git and Version Control Essentials

## Week 3

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### Overview

- Understanding Git: Cloning, Branching, Merging
- Working with Remote Repositories (GitHub/GitLab)
- Handling Merge Conflicts and Pull Requests
- Writing Meaningful Commit Messages and Using Git Tags
- Introduction to GitOps for Infrastructure Management

### Take-Home Task:

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- Set up a new Git repository, create branches, and push changes
- Resolve a merge conflict and document best practices

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# Python Basics for DevOps and Networking Essentials

## Week 4

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### Overview

- Python Scripting for Automation
- Working with APIs, JSON, and File Handling
- Introduction to Networking: TCP/IP, DNS, HTTP, SSH, Firewalls
- Network Troubleshooting Tools: netstat, curl, telnet, ping

### Take-Home Task:

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- Write a Python script to automate API calls or log parsing
- Troubleshoot a network issue using networking commands

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# Containers and Docker Essentials

## Week 5

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### Overview

- Understanding Virtualization vs. Containerization
- Introduction to Docker: Images, Containers, and Dockerfiles
- Docker Networking and Volume Management
- Multi stage Docker builds

### Take-Home Task:

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- Create a multi-container application using Docker Compose
- Optimize and secure a Dockerfile

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# Kubernetes Fundamentals

## Week 6

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### Overview

- Introduction to Kubernetes and Its Architecture
- Kubernetes Objects: Pods, Deployments, Services, ConfigMaps, Secrets
- Managing Applications Using kubectl
- Scaling Applications in Kubernetes

### Take-Home Task:

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- Deploy a sample application on a Kubernetes cluster
- Scale an application using Kubernetes resources

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# Helm, Storage, and Secrets

## Week 7

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### Overview

- Introduction to Helm and Chart Management
- Persistent Storage in Kubernetes (PVC, PV, Storage Classes)
- Managing Kubernetes Secrets Securely

### Take-Home Task:

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- Deploy an app using Helm
- Store and retrieve secrets securely in Kubernetes

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# CI/CD Pipelines with Jenkins and GitHub Actions

## Week 8

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### Overview

- CI/CD Basics and Workflow Design
- Automating Builds and Tests with Jenkins
- GitHub Actions for Deployment Automation
- Best Practices for Secure and Scalable Pipelines

### Take-Home Task:

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- Configure a GitHub Actions workflow for automated testing
- Set up a Jenkins pipeline for continuous deployment

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# Cloud Services Exploration (AWS/GCP)

## Week 9

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### Overview

- Key Cloud Services for DevOps: EC2, S3, IAM, VPC, RDS
- Working with Cloud CLIs (AWS CLI, GCP SDK)
- Deployment Strategies: Blue-Green, Canary, Rolling Updates

### Take-Home Task:

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- Deploy a static website on AWS S3
- Set up IAM roles and policies for a cloud application

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# Infrastructure as Code with Terraform

## Week 10

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### Overview

- Infrastructure as Code (IaC) Basics
- Writing Terraform Configurations and Managing State
- Terraform Modules and Best Practices

### Take-Home Task:

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- Write a Terraform script to deploy an EC2 instance
- Use Terraform to provision an AWS VPC

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# Terraform Mastery

## Week 11

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### Overview

- Advanced Terraform: Remote State, Workspaces, State Locking
- Dynamic Blocks, Loops, and Conditionals
- Managing Multi-Cloud Infrastructure with Terraform
- Terraform Best Practices: Security, Reusability, Performance

### Take-Home Task:

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- Implement an end-to-end cloud architecture using Terraform
  - Configure Terraform state locking with AWS S3 and DynamoDB
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# Monitoring and Observability

## Week 12

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### Overview

- Why Monitoring Matters in DevOps
- Introduction to Prometheus and Grafana
- Log Management with ELK Stack (Elasticsearch, Logstash, Kibana)
- Distributed Tracing with Jaeger

### Take-Home Task:

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- Set up Prometheus & Grafana to monitor a service
- Collect and visualize logs using the ELK stack

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# GitOps - Managing Deployments with Git

## Week 13

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### Overview

- What is GitOps? Git as a Single Source of Truth 🏗️
- Tools: ArgoCD, FluxCD
- Automating Infrastructure & App Deployments with GitOps

### Take-Home Task:

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- Deploy an app using ArgoCD
- Implement GitOps for Terraform automation


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# Security in DevOps (DevSecOps)

## Week 14

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### Overview

- DevSecOps & Shift-Left Security Approach 
- Security Scanning Tools: Snyk, Trivy, AquaSec
- Implementing Role-Based Access Control (RBAC)

### Take-Home Task:

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- Scan a container image for vulnerabilities
- Implement RBAC for Kubernetes

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# Open Source Contribution & Collaboration

## Week 15

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### Overview

- How Open Source Helps in DevOps Career 🚀
- Contributing to Open Source DevOps Projects
- GitHub Issues, Pull Requests & Documentation Contributions
- Programs like Google Summer of Code (GSoC) & LFX Mentorship

### Take-Home Task:

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- Find an open-source project & submit an issue or PR
- Write documentation for an open-source DevOps tool

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# Final Project & Career Guidance

## Week 16

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### Overview

- Work on a Real-World DevOps Project 🏆
- Resume Building, Interview Prep & Industry Trends

### Take-Home Task:

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- A project will be given and based on the evaluation, learner can get an opportunity to join the Dusra College team as an intern with 60,000rs/month Stipend