DevOps Bootcamp Syllabus

This program is designed to give you a thorough understanding of DevOps, which combines software development and IT operations to improve the agility and reliability of software delivery.

The goal of DevOps is to shorten the development lifecycle while also ensuring the quality of updates and releases. You will be introduced to popular DevOps tools and methodologies and gain hands-on experience that you can apply immediately.

Throughout the bootcamp, you'll dive into topics such as software development life cycle management, continuous integration and continuous deployment (CI/CD), Docker, Kubernetes, Git and GitHub, Infrastructure as Code (IaC) with Terraform, Monitoring with Prometheus, and GitOps with ArgoCD. You'll also get a hands-on introduction to Jenkins, an open-source automation server, which will help you understand how to automate parts of the development process.

One of the key aspects of this bootcamp is the practical, hands-on approach. You'll not only learn the theory behind DevOps practices, but also apply that knowledge through a series of hands-on labs and projects. These will give you practical experience in using a variety of DevOps tools and understanding their application in a real-world context.

Day 1 & 2: Introduction to DevOps, Software Lifecycle Management, and CI/CD

- DevOps Overview: Understanding DevOps, DevOps Culture, DevOps and Agile
- Software Development Life Cycle (SDLC) Overview: Understanding the SDLC, Various Models in SDLC (Waterfall, Agile, etc.)
- Application Lifecycle Management (ALM): Introduction to ALM, Requirements Management, Quality Assurance & Testing, Deployment & Maintenance
- CI/CD Overview: Introduction to CI/CD, Jenkins/Jenkins Pipeline, Setting up a CI/CD pipeline, CI/CD with Git and Docker

Day 3-5: Git, GitHub and GitHub Actions

- Introduction to Git
- Git Workflow

- Branching & Merging
- Resolving Merge Conflicts
- Advanced Git commands
- Introduction to GitHub
- Using GitHub for collaboration
- Introduction to GitHub Actions
- Creating Workflows with GitHub Actions

Day 6-8: Docker & Docker Compose

- Docker: Introduction to Docker, Docker Images & Containers, Docker Networking & Volumes, Dockerfile Basics
- Docker Compose: Introduction to Docker Compose, YAML & Docker Compose files, Running Multi-Container Applications

Day 9-22: Kubernetes (2 Weeks)

- Introduction to Kubernetes
- Pods, Deployments, Services
- ConfigMaps & Secrets
- Kubernetes Networking
- Persistent Storage in Kubernetes
- Helm and Package Management
- Kubernetes API and Custom Resources
- RBAC in Kubernetes
- Advanced Kubernetes Usage & Best Practices

Day 23-29: Jenkins (1 Week)

- Introduction to Jenkins
- Jenkins Pipeline
- Setting up a Jenkins pipeline
- Running Jenkins with Docker
- Jenkins Integration with Git and Docker

Day 30-36: GitOps & ArgoCD (1 Week)

- Introduction to GitOps: Understanding GitOps principles, GitOps workflow
- ArgoCD: Introduction to ArgoCD, Deploying Applications with ArgoCD

Day 37-43: Terraform & Infrastructure as Code (IAC) (1 Week)

- Understanding IAC
- Introduction to Terraform
- Creating and Managing Resources with Terraform
- Advanced Terraform Usage & Best Practices

Day 44-50: Prometheus & Monitoring (1 Week)

- Importance of Monitoring & Alerting
- Introduction to Prometheus
- Prometheus Metrics and Queries
- Setting up Alerts
- Implementing Monitoring with Prometheus

Day 51-57: Final Project (1 Week)

In this final week, students will apply everything they've learned to a comprehensive project that will demonstrate their proficiency in DevOps principles and tools.
Please note, each subject includes both theory and practical hands-on labs which is essential for gaining experience in the use of tools and platforms associated with DevOps.