

COURSE OVERVIEW



DEVOPS 101:

A HANDS-ON INTRODUCTION FOR BEGINNERS

Md. Amdadul Bari, Technical Lead, DevOps, BRAC IT

Course Details:

- **Course Title:** DevOps 101: A Hands-On Introduction for Beginners
- **Total Duration:** 5 Sessions (2 hours each)
- **Frequency:** Weekly
- **Target Audience:** Software Engineer

Course Objectives:

- Understand the foundational concepts of DevOps.
- Gain familiarity with Linux basics and the command line.
- Learn version control using Git and GitLab CI for automation.
- Develop skills to containerize applications with Docker.
- Deploy a basic Spring Boot and Angular application.

Materials Needed:

- Computer with a Linux environment (or VM setup if on Windows/Mac).
- Installed tools: Git, Docker, and IDEs like IntelliJ IDEA, VS Code.
- Access to BRAC IT GitLab for hands-on CI/CD exercises.

Evaluation:

- Continuous assessment through hands-on exercises & quiz (20 marks)
- Project submission (20 marks)
- Attendance (10 marks)

Session 1: Introduction to DevOps and Linux Basics

Topics:

What is DevOps?

- Overview of DevOps practices, tools, and culture
- Importance and goals of DevOps in the development lifecycle

Linux Basics

- Introduction to Linux and shell usage
- Basic Linux commands for navigation, file manipulation, and permissions

Hands-on Exercise

- Setting up a Linux environment and performing basic shell commands

Learning Outcomes

- Understand the role and value of DevOps.
- Familiarize with basic Linux commands and shell navigation.

Session 2: Introduction to Git and GitLab CI

Topics:

Version Control with Git

- Understanding version control and repository structure
- Basic Git commands for commit, push, pull, and branching

Introduction to GitLab CI

- Overview of GitLab CI/CD pipelines and their purpose
- Key elements of .gitlab-ci.yml

Hands-on Exercise

- Creating a GitLab repository and setting up a basic CI pipeline for a simple application.

Learning Outcomes

- Master basic Git commands and understand GitLab CI fundamentals.
- Implement a simple pipeline in GitLab CI.

Session 3: Introduction to Docker and Containerization

Topics:

What is Docker?

- Overview of containerization and Docker's role
- Basic Docker commands and Dockerfile creation

Containerizing Applications

- Writing Dockerfiles for simple applications
- Running, building, and managing Docker containers

Hands-on Exercise

- Building and running a Docker container for a sample application (e.g., Spring Boot or Node.js).

Learning Outcomes

- Understand containerization and Docker.
- Create and run Docker containers for basic applications.

Session 4: Deploying a Basic Spring Boot Application

Topics:

Preparing a Spring Boot Application

- Introduction to Spring Boot and sample project structure
- Building and running the application locally

Integrating GitLab CI with Docker

- Setting up a CI pipeline to build and push Docker images
- Automated deployment using GitLab CI

Hands-on Exercise

- Configuring GitLab CI to build and push a Docker image of a Spring Boot application.

Learning Outcomes

- Build and containerize a Spring Boot application.
- Deploy a containerized application using GitLab CI.

Session 5: Deploying an Angular Application and Final Project

Topics:

Preparing an Angular Application

- Preparing an Angular Application

Automated Deployment with GitLab CI and Docker

- Configuring GitLab CI for Angular builds and Dockerization

Final Project

- Deploying both Spring Boot and Angular applications in Docker

Hands-on Exercise

- Building, containerizing, and deploying an Angular application.
- Final Project: Create a CI/CD pipeline to deploy both applications.

Learning Outcomes

- Deploy a full-stack Spring Boot and Angular application.
- Apply DevOps concepts in deploying applications independently.

This outline includes a comprehensive session on DevOps, empowering participants to deeply grasp and effectively implement these essential concepts in their future projects.

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Learning & Engagement Hub
Human Resources Department, BRAC IT
Phone: +8801713481169
Email: training@bracits.com

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