

Day - 1

Introduction to CI/CD and CircleCI Fundamentals

- **Welcome and Introduction**

- Objective: Introduction to the course, instructors, and expectations.
- Overview of CircleCI and its importance in modern software development.
- Discuss the growing importance of CI/CD in automating development workflows.

- **Introduction to Continuous Integration and Delivery**

- Objective: Understanding the foundational principles of CI/CD.
- Topics Covered:
 - What is Continuous Integration (CI) and Continuous Delivery (CD)?
 - Benefits of CI/CD in the software development lifecycle.
 - Real-world use cases and examples.
- Hands-On Lab: Setting up a simple project and integrating it with a version control system like GitHub or Bitbucket.

- **Getting Started with CircleCI**

- Objective: Learn how to set up and configure CircleCI.
- Topics Covered:
 - Overview of CircleCI features and dashboard.
 - Connecting CircleCI with GitHub/Bitbucket repositories.
 - Creating and configuring the first CircleCI project.
 - CircleCI's web interface, settings, and integrations.
- Hands-On Lab: Create your first CircleCI pipeline and observe build and test results.

- **YAML Configuration Basics**

- Objective: Understanding CircleCI configuration using YAML.
- Topics Covered:
 - Introduction to CircleCI configuration files (.circleci/config.yml).
 - Understanding the structure of a CircleCI config file.
 - Basic steps like building, testing, and deploying.
- Hands-On Lab: Write a simple YAML configuration for your project to build and run tests.

Advanced CircleCI Features and Pipeline Optimization

- **CircleCI Pipelines and Workflows**

- Objective: Master workflows and pipelines for advanced automation.
- Topics Covered:
 - What is Continuous Integration (CI) and Continuous Delivery (CD)?
 - Benefits of CI/CD in the software development lifecycle.
 - Real-world use cases and examples.
- Hands-On Lab: Build and configure a pipeline with multiple jobs that run in parallel.

- **Advanced CircleCI Configuration**

- Objective: Dive deeper into CircleCI's advanced features.
- Topics Covered:
 - Configuring advanced pipelines with multiple workflows.
 - Using dynamic configurations with CircleCI's API.
 - Integration with Docker for building containerized applications.
 - Caching dependencies and optimizing build performance.
- Hands-On Lab: Create a more complex configuration that includes Docker, caching, and multiple workflows.

- **CircleCI Integrations and Tooling**

- Objective: Learn how to integrate CircleCI with external tools.
- Topics Covered:
 - Integrating CircleCI with version control systems (GitHub, GitLab, Bitbucket).
 - Using notifications and communication tools like Slack and email.
 - Integrating with deployment tools (AWS, Kubernetes, Docker, etc.).
- Hands-On Lab: Set up CircleCI to deploy to a cloud platform (e.g., AWS or Kubernetes).

- **CircleCI Caching, Artifacts, and Secrets Management**

- Objective: Understand caching strategies and secure information management.
- Topics Covered:
 - Caching dependencies to speed up builds.
 - Managing build artifacts and storing outputs.
 - Using CircleCI for managing sensitive information with environment variables and secret storage.
- Hands-On Lab: Configure caching for dependencies and store build artifacts.

CircleCI Best Practices, Troubleshooting, and Certification Preparation

- **CircleCI Best Practices**

- Objective: Learn the best practices to ensure optimal CI/CD pipelines.
- Topics Covered:
 - Writing efficient CircleCI configurations for speed and reliability.
 - Common pitfalls to avoid in CI/CD workflows.
 - Optimizing builds and workflows for faster execution.
- Case Study: Review a complex CI/CD pipeline from a real-world project and analyze improvements.

- **Troubleshooting and Debugging CircleCI Pipelines**

- Objective: Learn how to diagnose and resolve CircleCI pipeline issues.
- Topics Covered:
 - Debugging failed jobs and analyzing logs.
 - Understanding CircleCI error messages and troubleshooting common issues.
 - Using CircleCI's SSH access for job debugging.
- Hands-On Lab: Debug a failed pipeline and resolve the issues.

- **Preparing for the CircleCI Certification Exam**

- Objective: Review and prepare for the official CircleCI Certification Exam.
- Topics Covered:
 - Recap of the key concepts and features covered during the course.
 - Certification exam format and types of questions.
 - Exam tips and how to manage time during the test.

- **Final Assessment and Wrap-Up**

- Objective: Take the final mock exam and review all content learned.
- Activities:
 - Mock certification exam (30 minutes).
 - Review and discuss answers to the mock exam with the instructors.
 - Q&A session to clarify any final doubts.
 - Certification and next steps for CircleCI certification.