

## GTL-203:

# Modern Delivery Pipelines: GitLab CI, Helm, Kustomize, GitOps

**Course Description:** This training provides a comprehensive introduction to modern CI/CD practices and offers a deep, hands-on exploration of GitLab's CI/CD architecture. Participants will learn how to design, build, and operate GitLab pipelines – from foundational concepts to advanced, modular pipeline structures.

The course then extends into the cloud-native delivery ecosystem, where all tools and workflows are presented with a strong Kubernetes focus, including Helm, Kustomize, and GitOps operators such as Flux and ArgoCD. Release management is also covered through Kargo as an emerging, Kubernetes-native option. By the end of the training, participants will understand how these components fit together in real-world delivery workflows and will be able to build complete, production-ready CI/CD and GitOps pipelines.

**Structure:** The course combines concise theoretical explanations with extensive live demonstrations. All demo steps, commands, and configurations are provided so participants can fully reproduce every scenario on their own afterward.

**Target audience:** Developers, system administrators, and DevOps professionals who want to understand and apply GitLab CI/CD and GitOps workflows in cloud-native environments, and who aim to build reliable, automated delivery pipelines.

### Prerequisites:

- Linux system administration basics
- Basic Git knowledge
- Experience in software development
- Basic understanding of Kubernetes

**Duration:** 3 days

### Detailed Course Outline:

#### Module 1: The big picture

- Motivation behind CI/CD/CD
- Structure of a typical pipeline

#### Module 2: GitLab CI – Basics

- CI system generations
- Pipelines: structure & components
- Artifacts, containers, caching
- Triggers, deploys, environments

## **Module 3: GitLab CI – Advanced Methods**

- Unit, module, integration tests
- Complex pipeline design
- Modular pipeline structure

## **Module 4: Helm – Kubernetes Packaging**

- Charts: create & customize
- Hooks, templates, dependency management
- Helm vs. Kustomize

## **Module 5: Kustomize – Config Management**

- Motivation & env-specific setups
- Generators, transformers, plugins
- Patches & Helm comparison

## **Module 6: GitOps Operators**

- GitOps principles
- GitOps operators:
  - Flux, ArgoCD
- Repo structure & workflows
- Release management:
  - Kargo

## **Module 7: Complex scenario: GitOps in Action**

- GitLab CI + Helm + Kustomize + Flux
- Release flow
- Full pipeline showcase