JENKINS MASTERCLASS ROADMAP (Beginner Expert)

LEVEL 1: FOUNDATIONS (Beginner)

What is Jenkins?

- Jenkins is an open-source automation server.

- It helps you build, test, and deploy code automatically.

Real-Life Analogy:

- Jenkins is like a robot butler for your code.

Why Use Jenkins?

- Saves time by automating tasks

- Ensures consistency and catches errors early

- Supports many plugins

Core Concepts:

- Job (Project): A task Jenkins runs

- Build: Execution of a job

- Node (Agent): A machine Jenkins uses to run jobs

- Pipeline: Series of build/test/deploy steps

Practice:

- Install Jenkins locally

- Run your first Hello World Freestyle job

LEVEL 2: ESSENTIALS (Intermediate)

Types of Jenkins Jobs:

1. Freestyle Project GUI based

2. Pipeline Project code-based using Jenkinsfile

3. Multibranch Pipeline auto-pipelines for branches

Jenkins Pipeline Syntax:

```
pipeline {
  agent any
  stages {
    stage('Build') { steps { echo 'Building...' } }
    stage('Test') { steps { echo 'Testing...' } }
    stage('Deploy') { steps { echo 'Deploying...' } }
  }
}
```

Key Plugins:

- Git, Maven, Docker, Pipeline, Blue Ocean

Exercises:

- Create a pipeline from GitHub repo
- Add build and test stages
- Use GitHub webhooks to trigger builds

LEVEL 3: ADVANCED AUTOMATION

Advanced Pipeline Techniques:

- Parallel Stages, Post Actions, Environment Variables, Parameterized Jobs

Real-World Use Cases:

- Auto-deploy Docker containers

- CI/CD for microservices

- Integration with Kubernetes

Common Mistakes to Avoid:

- Hardcoding credentials (use Credentials Plugin)

- Ignoring failures, not using pipelines as code

Pro Tips:

- Use Shared Libraries for reuse

- Store Jenkinsfile in Git

- Integrate with Slack/Teams

Tools to Pair With Jenkins

Git - Source control

Maven/Gradle- Build tools

Docker - Containerization

Kubernetes - Orchestration

SonarQube - Code quality

Final Project (Expert-Level)

Build a complete CI/CD pipeline:

- Clone code from GitHub

- Build with Maven

- Run tests

- Create Docker image

- Push to Docker Hub

- Deploy to Kubernetes

Resources

- Jenkins Docs: https://www.jenkins.io/doc/

- Pipeline Syntax Generator (in Jenkins UI)

- GitHub: https://github.com/jenkinsci

- YouTube: Academind Jenkins CI/CD