**Introduction to Continuous Integration, Continuous Delivery, and Jenkins-CI**

* Skill Level: Introductory 2 Day Course

**Overview**: This course provides a comprehensive introduction to Continuous Integration (CI), Continuous Delivery (CD), and Jenkins-CI, a popular automation tool used in software development. Participants will gain a foundational understanding of Agile AppDev and Extreme Programming, followed by an in-depth exploration of CI and CD concepts. They will also learn how to install, configure, and run Jenkins to streamline their software development processes effectively.

**Learning Objectives:** Upon completing this course, participants will be able to:

* Understand the fundamentals of Agile Development.
* Define Continuous Integration and Continuous Delivery and recognize their significance in modern software development.
* Set up and run Jenkins for effective automation and continuous integration.
* Configure Jenkins jobs for various types of projects, including .NET, Node.js, C++, and more.
* Utilize Jenkins Pipeline for seamless continuous delivery.
* Secure Jenkins and implement best practices for its efficient usage.

**Audience**: This course is ideally suited for individuals with a technical background, including software developers, IT professionals, and system administrators, seeking to enhance their understanding of Continuous Integration, Continuous Delivery, and Jenkins-CI.

**Agenda**:

Module 1: Foundations of Continuous Integration and Continuous Delivery

• Agile AppDev Fundamentals

• Understanding XP Flow (Extreme Programming)

• Embracing Agile Development

• Introduction to Continuous Integration

• Setting up Continuous Integration Environment

• Incorporating Artifact Management in CI

• Introduction to Continuous Delivery

• The Intersection of DevOps and Continuous Delivery

• Overcoming Continuous Delivery Challenges

• Exploring Jenkins Continuous Integration

• Key Features of Jenkins

Module 2: Installing and Configuring Jenkins

• Downloading and Installing Jenkins

• Running Jenkins as a Stand-Alone Application

• Running Jenkins on an Application Server

• Understanding the Jenkins Home Folder

• Installing Jenkins as a Windows Service

• Initial Configuration of Jenkins

• Configuring Jenkins with the Configuration Wizard

• Managing and Configuring Tools in Jenkins

• Logging in to Jenkins

Module 3: Managing Jenkins Jobs

• Overview of Different Jenkins Items

• Configuring Source Code Management (SCM) in Jenkins

• Working with Subversion (SVN) in Jenkins

• Working with Git in Jenkins

• Storing and Managing Credentials in Jenkins

• Configuring Build Triggers in Jenkins

• Building Projects with Maven in Jenkins

Module 4: Advanced Jenkins Jobs

• Creating Parameterized Jobs in Jenkins

• Utilizing Built-in Environment Variables in Jenkins

• Defining Custom Parameters for Jenkins Jobs

• Implementing Configuration Matrix in Jenkins

• Monitoring External Jobs in Jenkins

Module 5: Jenkins for Non-Java Projects

• Building .NET Projects with Jenkins

• Installing and Configuring the MSTest Plugin in Jenkins

• Setting up Jenkins for Node.js Application Builds

• Building C++ Projects with Jenkins

• Executing PowerShell Scripts with Jenkins

Module 6: Jenkins Job Templates

• Understanding Template Jobs

• Utilizing the Template Jobs Plugin

Module 7: Continuous Delivery with Jenkins Pipeline

• Introduction to Continuous Delivery

• Integrating DevOps with Continuous Delivery

• Addressing Continuous Delivery Challenges

• Implementing Continuous Delivery with Jenkins

• Using the Pipeline Plugin in Jenkins

• Defining and Managing Jenkins Pipelines

• Achieving Parallel Execution in Jenkins Pipelines

• Interacting with Jenkins Pipelines

Module 8: Groovy DSL for Jenkins

• Introduction to Groovy Scripting

• Working with Comments, Data Types, and Operators in Groovy

• Implementing Conditional Statements and Loops in Groovy

• Utilizing Lists and Maps in Groovy

• Exception Handling in Groovy

• Understanding Methods, Classes, Inheritance, and Interfaces in Groovy

Module 9: Securing Jenkins

• Overview of Jenkins Security

• Implementing Authentication in Jenkins

• Configuring Authorization in Jenkins

• Ensuring Confidentiality in Jenkins

• Activating and Configuring Security Features in Jenkins

• Managing Authentication with Jenkins's Internal User Database

• Applying Matrix-Based Security in Jenkins

• Role-Based Access Control in Jenkins

Module 10: Jenkins Plugins

• Introduction to Jenkins Plugins

• Utilizing SCM Plugins in Jenkins

• Leveraging Build and Test Plugins in Jenkins

• Analyzing Code with Jenkins Analyzers Plugins

• Collaborating with Teams Using Jenkins

• Installing Jenkins Plugins

Module 11: Distributed Builds with Jenkins

• Overview of Distributed Builds

• Configuring Agent Machines for Jenkins

• Setting up Jenkins Master Configuration

• Configuring Jenkins Projects for Distributed Builds

Module 12: Containerized Builds with Jenkins

• Introduction to Docker for Jenkins

• Running Jenkins in a Docker Container

• Creating Docker Containers from Jenkins Jobs

• Leveraging the Jenkins Docker Build Step Plugin

• Utilizing Ephemeral Build Agents

Module 13: The Jenkins API

• Understanding the Remote Access API in Jenkins

• Exploring the Capabilities of Jenkins Remote API

• Enabling Remote API and CSRF Protection with API Token

• Enabling Remote API and CSRF Protection with Crumb

• Making Remote API Calls in Jenkins

• Introduction to Jenkins CLI

• Configuring Jenkins to Use CLI

• Downloading and Using Jenkins CLI

Module 14: Scripting in Jenkins

• Introduction to Scripting in Jenkins

• Utilizing the Jenkins Script Console

• Invoking Groovy Scripts from Jenkins Jobs

• Interacting with Jenkins API through Scripts

Module 15: User Interface Customization in Jenkins

• Exploring User Interface Customization Options

• Customizing the UI with CSS

• Understanding the User Content Folder

• Writing a Jenkins Plugin

• Utilizing the Blue Ocean Plugin

Module 16: Best Practices for Jenkins

• Implementing Best Practices for a Secure Jenkins Environment

• Managing Users with Best Practices in Jenkins

• Backing Up Jenkins Instances with Best Practices

• Achieving Reproducible Builds with Best Practices

• Implementing Testing and Reporting Best Practices in Jenkins

• Scaling Jenkins for Large Systems with Best Practices

• Employing Best Practices for Distributed Jenkins

Materials and Setup: All applicable course software, digital courseware files or course notes, labs, data sets, and solutions, live coaching support channels, and rich extended learning and post-training resources are provided for you.