**DevOps for Web Developers**

**Section 1: Getting Started – DevOps Concepts, Tools, and Technologies**

**1.1 The Course Overview**

This video will give us the overview of the entire course.

**1.2 Understanding the DevOps Movement**

Understand the basic concepts of DevOps.

* Change to push dates to satisfy customers

**1.3 The DevOps Lifecycle**

Learn to automate builds, unit tests, and packaging processes while CD is concerned with the application delivery pipeline across different environments.

* Build automation
* Automate test case execution
* Execute the scripts based on the requirement

**1.4 Tools and Technologies**

Learn to keep the entire pipeline running to produce effective outcomes.

* Provide support for nonlinear development
* Build tools with the Apache 2.0 license

**1.5 An Overview of a Sample Java EE Application**

Learn to build simple and robust database-oriented applications to demonstrate the use of Spring's core functionality.

* Create and configure a deployment pipeline
* Install and configure Docker
* Configure infrastructure monitoring

**Section 2: Continuous Integration with Jenkins 2**

**2.1 Installing Jenkins and the Jenkins Dashboards**

Learn to provide us with multiple ways to install Jenkins for all types of users, then we can manage all builds and therefore manage the application delivery pipeline as well.

* Set up Jenkins
* Customize the Jenkins page
* Create the first admin user page

**2.2 Configuring Java and Mavens in Jenkins to Build Job for a Java Application with Maven**

Understand how Maven works and what is required in terms of execution, and perform steps to create and configure a new build job.

* Provide a name and the JAVA\_HOME path
* Create an item name
* Navigate to the jobs directory

**2.3 Configuring and Authenticating Source Code on GitHub**

Gain the ability to configure a source code repository with the build job. We will use the open source Spring application hosted on GitHub.

* Generate a new SSH key to use for authentication
* Verify the newly generated keys in the .ssh folder

**2.4 Configuring Build Job and JUnit**

Achieve the ability to configure a PetClinic build job and to configure JUnit-related settings in the build job configuration.

* Provide the GitHub URL for the sample Spring project
* Provide a path for Test report XMLs based on the workspace
* Verify the build status on the Jenkins dashboard

**2.5 The Dashboard View Plugin – Overview and Usage**

Learn to provide a different view implementation based on a portal kind of layout.

* Configure dashboard port lets for the top, left, right, and bottom columns
* Add different port lets based on your requirements to the view
* Find a test result chart on the build job's dashboard

**2.6 Managing Nodes**

Assign different build jobs to different slaves in the build configuration and use the master-slave system to manage its overall lifecycle.

* Create and configure a slave node in Jenkins 2
* Configure build jobs for master and slave nodes

**2.7 Sending E-mail Notifications Based on buildstatus**

Learn to add a scenario where a build failure or test case failure has to be notified to a specific set of stakeholders.

* Verify e-mail notifications
* Execute a compile goal against the Maven build

**2.8 Integrating Jenkins and Sonar**

Learn to manage seven axes of code quality, such as architecture and design, duplications, unit tests, potential bugs, complexities, coding rules, and comments.

* Install the Sonar Qube plugin
* Extract the installable directory from the ZIP file
* Configure Sonar Qube Scanner installations

**Section 3: Building the Code and Configuring the Build Pipeline**

**3.1 Creating Built-in Delivery Pipelines**

Achieve the ability to create delivery pipelines using a domain-specific language (DSL).

* Generate a new pipeline
* Add an input for the pipeline in the script box
* Execute the demo pipeline and verify the console

**3.2 Creating a Pipeline for Compiling and Executing Test Units**

Learn to create a pipeline for compiling source files and executing unit test cases.

* Add the console output to verify the execution process
* Create two stages and name it as compile and test
* Verify the pipeline steps

**3.3 Using the Build Pipeline Plugin**

Learn to create a chain of jobs for end-to-end automation.

* Create a build pipeline view
* Provide a view name for the build pipeline
* Verify the list of the Downstream Projects

**3.4 Integrating the Deployment Operation**

Learn to integrate the deployment operation into the build pipeline.

* Execute JUnit test cases
* Add a build step to copy artifacts
* Verify the workspace directory

**Section 4: Installing and Configuring Chef**

**4.1 Getting Started with Chef**

Get a hands-on with provisioning instances and configuration management.

* Configure and manage nodes using Chef workstations

**4.2 Overview of Hosted Chef**

Learn to install and manage Chef server on your own or you can use hosted Chef – SaaS offering to utilize in configuration management.

* Create an organization
* Provide the full name and short name of the organization

**4.3 Installing and Configuring a Chef Workstation**

Learn to verify whether the Chef client has been installed.

* Execute the chef-client -version command to verify whether the Chef client has been installed
* Use sudo to run the command

**4.4 Converging a Chef Node Using a Chef Workstation**

Achieve the ability to setup a runtime environment in node using Chef workstation.

* Verify the IP address using ifconfig
* Create a virtual machine using VMware Workstation or Virtual Box
* Verify the node virtual machine

**4.5 Installing Software Packages Using Cookbooks**

Learn to set up the run time environment

* Install Java and Tomcat to run a Java EE application

**4.6 Creating a Role**

Gain the ability to provide a path for different patterns and workflow processes

* Verify the Reports section in the hosted Chef account

**Section 5: Installing and Configuring Docker**

**5.1 Understanding the Difference Between Virtual Machines and Containers**

Learn to understand what containers is.

* Find out the reason behind the popularity of containers

**5.2 Installing and Configuring Docker on CentOS**

Learn to create a virtual machine using VMware Workstation or VirtualBox, install CentOS 6.6 or6.7.

* Run the sample hello-world image of Docker
* Verify the Docker installation

**5.3 Creating Your First Docker Container**

Achieve the ability to run a sample hello-world container by creating a first Docker container.

* Fetch the hello-world image in the Docker Hub
* Create an Ubuntu container and open its bash shell directly
* Use the docker images command to verify that the existing images are available locally

**5.4 Understanding the Client-Server Architecture of Docker**

Learn to use the existing Tomcat image and create a sample image with a Tomcat installation.

* Verify the images with Docker images to run the Tomcat image
* Use docker inspect with the container ID to find out the IP address of the container

**5.5 Managing Containers**

Gain the ability to run the Tomcat container as a background process.

* Provide a custom name to the container
* Get access to a terminal on the container

**5.6 Creating a Docker Image from Docker file**

Learn to create a sample image file. We can build a Docker image using a Dockerfile.

* Create an image with Java 8 and Tomcat 9
* Run the Docker file and build an image out of it

**Section 6: Cloud Provisioning and Configuration Management with Chef**

**6.1 Chef and Cloud Provisioning**

Learn provisioning in a Cloud environment and setting up a runtime environment.

* Create instances in different cloud environments
* Setup a consistent runtime environment

**6.2 Installing Knife Plugins for Amazon Web Services and Microsoft Azure**

Learn to install knife plugin using chef development kit.

* Create bootstrap and manage EC2 instances
* Configure Amazon EC2 credentials

**6.3 Creating and Configuring a Virtual Machine in Amazon EC2**

Learn to verify the existing nodes converged by Chef.

* Install run time environments

**6.4 Creating and Configuring a Virtual machine in Microsoft Azure**

Learn to provide information to knife regarding our Azure account and credentials.

* Create a virtual machine in Microsoft Azure
* Verify the newly created virtual machine

**6.5 Docker Containers**

Learn to use Tomcat as a web application server to deploy the PetClinic application.

* Use the image available in Docker Hub
* Create a container from the newly created Tomcat image

**Section 7: Deploying an Application in AWS, Azure, and Docker**

**7.1 Prerequisites – Deploying Our Application on a Remote Server**

Learn to use Windows Agent for compilation and deployment to see how an Agent-based architecture can be utilized.

* Verify the status of the agent on the master node
* Prepare a remote server by downloading and setting up Tomcat

**7.2 Deploying an Application in Docker Container**

Learn to deploy an application with the Deploy plugin of Jenkins.

* Execute the docker build command to create an image
* Access the Manager App URL

**7.3 Deploying an Application in AWS**

Learn to deploy the PetClinic application on the AWS platform.

* Deploy an application on AWS Elastic Beanstalk
* Create a sample application to understand how Elastic Beanstalk works

**7.4 Deploying an Application in Microsoft Azure**

Get to know how we can deploy our PetClinic application using Microsoft Azure app services.

* Configure the Azure web app for Java web application hosting

**Section 8: Monitoring Infrastructure and Applications**

**8.1 Getting Started – Monitoring**

Learn to notify the respective stakeholders for corrective measures.

* Make an application highly available and avoid failures

**8.2 Overview of Monitoring Tools and Techniques**

Learn the detail techniques of the Nagios monitoring tool, Azure Web Apps Monitoring, and AWS Elastic Beanstalk.

* Configure Nagios to monitor resources from Cloud platforms
* Configure our AWS instance to monitor
* Configure monitor using configuration wizards

**8.3 Monitoring AWS Elastic Beanstalk**

Learn to deploy the PetClinic Application onAWS Elastic Beanstalk.

* Generate the health status based on the application

**8.4 Monitoring Microsoft Azure Web App Service**

Learn to deploy the PetClinic Application in the Azure Web Apps.

* Verify the activities performed on an application
* Configure settings to recover from application issues

**Section 9: Orchestrating Application Deployment**

**9.1 Creating Build Jobs for End-to-end Automation**

Achieve the ability to configure end-to-end automation for build job execution

* Use deployment for configuration management
* Introduce build jobs for end-to-end automation

**9.2 Configuring SSH Authentication Using a Key**

Learn to configure SSH authentication using a key to allow the Jenkins.

* Access the SSH Chef workstation from Jenkins
* Configure the virtual machine where Jenkins is installed to access virtual machine

**9.3 Configuring the Build Pipeline for Build Job Orchestration**

Learn to integrate all the work in a way that continuous integration, cloud provisioning, configuration management, and continuous delivery.

* Create the complete build pipeline
* Configure the archive artifacts

**9.4 Executing the Pipeline for Application Deployment Automation**

Learn to provide features to orchestrate end-to-end automation for application deployment.

* Create a new item in the Jenkins dashboard

**9.5 Hygieia – a DevOps Dashboard**

Achieve the ability to provide aunified, configurable, and easy-to-use DevOps dashboard for an end-to-end application delivery pipeline.

* Create a DevOps dashboard
* Configure SVN, Git, Sonar, Jenkins, and IBM Urban Code Deploy in a Hygieia dashboard