**Day 1**

**Introduction to DevOps**

* Why of DevOps?
* DevOps Tools – Overview and Use case
* Source Control Management (SCM Tools)
* Continuous Integration, Continuous Delivery and Continuous Deployment
* Static Code Analysis Tool
* What are Storage Artifacts?
* What is Configuration Management?

**Introduction to Puppet**

* Overview of Puppet
* Puppet Pre-install tasks
* Hands-on: Puppet Installation and Configuration on Linux
* Hands-on: Puppet Server post-installation configuration
* Overview of Puppet Console
* Puppet Enterprise vs Opensource
* Puppet vs Chef vs Ansible vs Terraform

Lab: Puppet Installation and Configuration. Lab: Overview of Puppet Console

Lab: Puppet Ad-hoc Commands

Lab: Puppet Facts

Lab: Puppet Server and Agent configuration

**Puppet Architecture**

* Puppet Server and Puppet Agent
* Understand how Puppet reports Facts and the Catalog
* Sizing Puppet Master
* Differences between Monolithic and Split Puppet architectures

**Day 2**

Managing Access to Puppet Console

PQL

puppet\_core\_types\_cheatsheet

Running Puppet on nodes in Puppet Enterprise Console

Making changes to node groups

Creating and running Tasks in Puppet Enterprise Console

Running puppet in Puppet Enterprise Console

Job vs Task

Patching

Certificate Management

Setup Puppet Server on each node

Setup Jupyter for IDE (Optional)

Create GitHub account and Push Pull Repos

**Understanding version control (Git)**

* Git Overview
* Hands-on: Git in Practice
* Hands-on: Setting Up Your Profile
* Hands-on: Creating a Git Repository
* Hands-on: Creating GitHub account
* Hands-on: Cloning Git Repo
* Hands-on: Changes in the Git Repo
* Hands-on: Commit Git Repo
* Hands-on: Push/Pull Git Repo

**Puppet Modules**

* Modules overview
  + Module structure
  + Module names
  + Files in modules
  + Templates in modules
  + Hands-on: Writing modules
* Common Built in Modules
* Hands-on: Writing Manifest files
* Hands-on: Installing modules from the Forge
* Hands-on: Searching the Forge from CLI and web
* Hands-on: Using the Puppet Module command
* Types and Providers
* Lab: Converting tomcat.conf into a template
* Lab: Creating and applying a Puppet Manifest
* Lab: Modules, module path structure, and testing

**Puppet Language**

* How Puppet uses resources for configuration management?
* Developing Puppet resources
* File Serving
* Relationships
* Package / File / Service
* Variables
* Conditional statements
* Built-in resource types
* Description of resources–resource types, titles, and body
* Core resource types
* Inspecting resources
* Hands-on: Basic Linux administrator tasks
  + Managing Packages
  + Managing Services
  + Managing Files & Folders
  + Managing Users

Lab: Developing Puppet resources, applying resources to nodes

**Day 3**

**Learning Classes**

* Understanding Puppet classes
* Hands-on: Manifests with Classes
* Hands-on: Class Inheritance

Lab: Manifests and Classes: Create class definitions, validate class syntax and apply to Puppet nodes

Lab: Converting tomcat class into a parameterized class

**Values and data types**

* Strings
* Numbers
* Binary
* Booleans
* Arrays
* Hashes
* Sensitive
* Resource and class references
* Lab: Create manifest using various data types

**Learning Variables**

* Using variables in Puppet
* Writing Puppet code without repeating
* Writing Classes with parameters
* Using the facter tool with modules and classes

Lab: Data Driven Modules - Params and Facts

Lab: Variables and Parameters: learn how to assign variables in a manifest, create classes with parameter

**Hiera**

* Introduction to Hiera
* Use cases of Hiera
* Configuring Hiera
* Hiera best practices

Lab: Installing and Using Hiera

**Day 4**

**Conditional Statements**

* Understand and use these conditional statements:
  + If
  + Unless
  + Case
  + Selector

Lab: Conditional Statements: Using conditional statements in resources and module

**Iteration and Loops**

* Iteration functions
* Declaring resources
* Iteration with defined resource types
* Using iteration to transform data
* Breaking out of the loop
* Lab: Refactor the manifest file to use iteration concepts

**Managing nodes in Puppet Enterprise**

* Hands-on: Adding and removing agent nodes
* Hands-on: Adding and removing agentless nodes
* How nodes are counted
* Hands-on: Running Puppet on nodes
* Hands-on: Grouping and classifying nodes
* Hands-on: Making changes to node groups
* Preconfigured node groups

**Orchestrating Puppet runs, tasks, and plans**

* How Puppet orchestrator works?
* Hands-on: Setting up the orchestrator workflow
* Hands-on: Configuring Puppet orchestrator
* Hands-on: Run Puppet on demand
* Tasks in PE
* Plans in PE

**Day 5**

**Learning Advanced Topics**

* Environments
* Hands-on: Creating a dev environment and adding nodes to it
* Hands-on: Creating custom modules
* Automatic data binding

Lab: Resource ordering: Ensure the correct order of modules and classes

Lab: Defined resource types: Create new resource types

**Hands-on: Misc Use Case Labs**

* Linux Patching
* Windows Patching
* Set Windows env
* Install and remove Windows features
* Harden windows server
* Scheduled task on Windows
* Create user in Windows
* Create group in Windows

**Testing and Troubleshooting**

* Hands-on: Create Tests for Our Code
* Hands-on: Log locations
* Troubleshooting puppet infrastructure run commands
* Troubleshooting connections between components
* Troubleshooting the databases
* Troubleshooting backup and restore
* Using PRY to Inspect the Puppet Server

**Performance tuning in Puppet Enterprise**

* Number of JRubies
* JVM Heap Size
* Tying Together max-active-instances and Heap Size
* Potential JAVA ARGS settings
* Using the puppet infrastructure tune command

**Custom Application orchestration using Puppet**

* Overview
* Install and configure tomcat
* Deploy WAR files to tomcat server
* Configure deployed application