

Ansible Automation (30 hours)

Module 1: Introduction to Ansible

- What is Configuration Management?
- Introduction to Ansible and its use cases
- Agentless architecture of Ansible vs other tools (Puppet, Chef, etc.)
- How Ansible works: Control Node & Managed Nodes
- Supported OS & basic requirements

Module 2: Installing and Setting Up Ansible

- Installation on Ubuntu/CentOS/Windows Subsystem for Linux (WSL)
- SSH Key setup and inventory management
- Ansible configuration file (`ansible.cfg`)
- Static vs Dynamic Inventory
- Ad-hoc commands to test connectivity

Module 3: Working with Ansible Modules

- Using Ansible command line (ansible)
- Essential modules: ping, command, shell, copy, file, yum, apt, service, package
- Gathering facts using setup
- Module documentation (ansible-doc)

Module 4: Playbooks and YAML Basics

- Introduction to Playbooks
- YAML syntax and structure
- Writing basic playbooks
- Variables and Facts
- Tags and conditional statements (when)

Module 5: Handlers, Loops, and Templates

- Handlers to restart services
- Using loops with with_items and loop
- Jinja2 templating basics
- Dynamic configuration using .j2 templates

Module 6: Roles and Directory Structure

- Why Roles?
- Creating and using roles (`ansible-galaxy init`)
- Role structure: tasks, handlers, vars, defaults, templates, files
- Role dependencies and tagging

Module 7: Ansible Vault and Security

- Introduction to Ansible Vault
- Encrypting variables and files
- Using `--ask-vault-pass` and vault IDs
- Best practices for secret management

Module 8: Ansible for DevOps & CI/CD

- Automating Docker installation & deployment
- Deploying apps on Linux/Windows servers
- Using Ansible with Jenkins for CI/CD
- Git integration and running playbooks from repositories

Module 9: Ansible with Kubernetes & Cloud

- Installing and configuring Kubernetes using Ansible
- Provisioning AWS/GCP resources with Ansible
- Using Ansible modules for cloud (ec2, s3, gcp_compute, etc.)
- Infrastructure as Code (IaC) with Ansible

Module 10: Advanced Topics

- Error handling and retries
- Ansible AWX
- Ansible Automation Platform
- Performance tuning and parallelism