

Syllabus for Internship Program

Module-1

IT & Linux Fundamentals

- Software Development Life Cycle (SDLC)
- Agile methodology/Waterfall methodology
- Introduction to Cloud & DevOps
- DevOps culture & roles
- Linux architecture & file system
- Basic Linux commands
- User & permission management
- Shell scripting basics

SOFTWARE DEVELOPMENT LIFE CYCLE



Module-2

AWS Topics for Job-Ready Program

➤ AWS Fundamentals

- Introduction to IT Infrastructure
- What is a Data Centre? What is the Cloud concept?
- What is Cloud Computing?
- AWS Global Infrastructure
 - Regions, AZs, Edge Locations
- AWS Shared Responsibility Model
- AWS Pricing & Free Tier
- AWS Management Console, CLI, SDK basics



➤ IAM – Identity & Access Management (Very Important)

➤ Top interview topics

- IAM users, groups, roles
- Policies (inline vs managed)
- MFA and security best practices
- IAM role for EC2
- Real-time use cases (why DevOps uses roles)

➤ EC2 – Compute Services (Core Skill)

- EC2 instance types
- AMIs
- Key pairs
- Security groups vs NACLs
- EBS volumes & snapshots
- User data (bootstrapping)
- Elastic IP
- Hands-on: Launch & manage EC2



➤ Storage Services

➤ S3 (Most used)

- Buckets & objects
- Storage classes
- Versioning & lifecycle policies
- Bucket policies vs IAM policies
- Static website hosting
- S3 + CloudFront basics

➤ EBS & EFS

- EBS volume types
- EFS use cases
- Snapshot & backup concepts

➤ VPC & Networking (Interview Favourite)

- VPC, CIDR, subnets
- Public vs private subnet
- Internet Gateway & NAT Gateway
- Route tables
- Security Groups vs NACLs
- VPC Peering
- Load balancer networking basics

➤ Load Balancing & Auto Scaling

- Elastic Load Balancer types
 - ALB, NLB, CLB
- Auto Scaling Groups
- Health checks
- High availability architecture

➤ Databases (Basic + Practical)

- RDS (MySQL / PostgreSQL)
- Multi-AZ vs Read Replica
- Backup & restore
- DynamoDB basics (NoSQL)
- When to use which DB

➤ Monitoring & Logging

- CloudWatch metrics, logs, alarms
- CloudTrail (audit & tracking)
- Basic troubleshooting using logs

➤ Security & Best Practices

- Shared Responsibility deep dive
- Encryption at rest & in transit
- Security best practices for EC2 & S3
- AWS Well-Architected Framework (basics)



➤ DevOps + AWS Integration (Very Important)

➤ This makes students job-ready

- EC2 + Git + Jenkins integration
- CI/CD pipeline on AWS
- Jenkins on EC2
- S3 for artifacts
- Docker on EC2
- AWS with Ansible basics
- Terraform with AWS (EC2, S3, VPC)

➤ Real-Time Use Cases & Projects

- Host a static website on S3
- Deploy application on EC2
- CI/CD pipeline using Jenkins + AWS
- Auto scaling application architecture
- Infrastructure creation using Terraform

➤ Interview Preparation

- Common AWS interview questions
- Scenario-based questions
- Resume project explanation
- Cost optimisation questions



Module-3

Microsoft Azure – Job-Ready Program

➤ Azure Fundamentals

- What is Cloud Computing?
- Azure Global Infrastructure
 - Regions, Region Pairs, Availability Zones
- Azure Subscription & Resource Groups
- Azure Portal, Azure CLI & Cloud Shell
- Azure Pricing, Cost Management & Free Tier
- Azure Shared Responsibility Model



➤ Identity & Access Management (Core Skill)

➤ Azure Active Directory (Entra ID)

- Users, Groups, Roles
- Role-Based Access Control (RBAC)
- Managed Identities
- Azure AD vs IAM (AWS comparison)
- Security best practices

➤ Compute Services

- Azure Virtual Machines (VMs)
- VM sizes & availability options
- Managed Disks
- VM Scale Sets
- Custom images & snapshots
- VM extensions
- Hands-on: Launch & manage VMs

➤ Storage Services

- Azure Storage Account overview
- Blob Storage (containers, lifecycle)
- File Storage
- Disk Storage
- Storage security & access tiers
- Static website hosting on Blob Storage

➤ Azure Networking (Interview Favourite)

- Virtual Network (VNet)
- Subnets & CIDR
- Network Security Groups (NSG)
- Azure Load Balancer
- Application Gateway
- NAT Gateway
- VNet Peering
- Azure DNS basics



➤ High Availability & Scalability

- Availability Sets vs Availability Zones
- Load balancing strategies
- Auto-scaling concepts
- Azure Traffic Manager (overview)

➤ Databases (Practical Level)

- Azure SQL Database
- Azure Database for MySQL / PostgreSQL
- Backup & restore
- High availability options
- When to choose which database

➤ Monitoring, Logging & Governance

- Azure Monitor
- Log Analytics Workspace
- Alerts & metrics
- Azure Activity Logs
- Azure Advisor
- Azure Policy (governance basics)



➤ Security & Compliance

- Azure Security Centre (Defender for Cloud)
- Key Vault (secrets & certificates)
- Encryption at rest & in transit
- Azure Firewall (overview)
- Best security practices

➤ Azure DevOps (Must for Job Readiness)

- Azure DevOps overview
- Azure Repos (Git)
- Azure Pipelines (CI/CD)
- Build & Release pipelines
- YAML pipelines basics
- Artifacts & Boards overview
- Integrating Azure DevOps with Azure services

➤ Containers & Kubernetes on Azure

- Docker fundamentals on Azure
- Azure Container Registry (ACR)
- Azure Container Instances (ACI)
- Azure Kubernetes Service (AKS)
- Container deployment workflow
- Basic AKS troubleshooting

➤ Infrastructure as Code (IaC)

- Terraform with Azure
- ARM templates (conceptual)
- Automating VMs, VNet, Storage
- Best practices for IaC

➤ Backup, DR & Cost Optimisation

- Azure Backup
- Site Recovery (overview)
- Disaster recovery strategies
- Cost management & optimization techniques
- Budgets & alerts

➤ Real-Time Projects & Use Cases

- Host application on Azure VM
- CI/CD pipeline using Azure DevOps
- Secure Azure architecture design
- Deploy containerised app on AKS
- Infrastructure provisioning using Terraform

➤ Interview Preparation

- Azure interview questions
- Scenario-based questions
- Resume project explanation
- Common DevOps + Azure scenarios



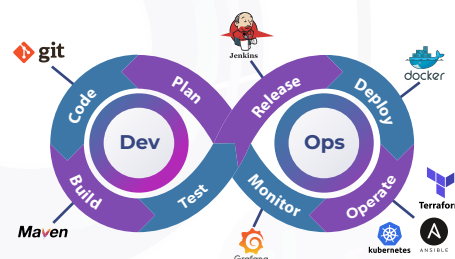
➤ Bonus / Optional Topics

- Azure Functions (serverless basics)
- Event Grid / Service Bus (concepts)
- Hybrid cloud overview

Module-4

DevOps Tools

- What is DevOps? DevOps lifecycle
- Git & GitHub (Version Control System/SCM)
 - Repositories, branches, commits
 - Git workflows
- Maven (Build tool)
- CI/CD concepts
- Jenkins
 - Jenkins installation & configuration
 - Freestyle & pipeline jobs
- Docker (Containerization)
 - Containers vs VMs
 - Docker images & containers
 - Dockerfile & Docker Hub
- Kubernetes (Container Orchestration Tool)
 - Architecture & basic components
 - Pods
 - Deployments
 - Services



➤ Terraform

➤ Introduction & Fundamentals

- What is Infrastructure as Code (IaC)?
- Why Terraform? Real-world use cases
- Terraform vs CloudFormation / ARM (high-level)
- Terraform architecture & workflow
- Terraform installation & setup



Terraform

➤ Core Terraform Concepts

- Terraform configuration files (.tf)
- Providers
- Resources
- Variables & input values
- Output values
- Terraform state file
- Backend basics (local state)

➤ Terraform Commands

- terraform init
- terraform plan
- terraform apply
- terraform destroy
- terraform validate
- terraform fmt

➤ Hands-on Use Cases

- Create an EC2 instance / Azure VM using Terraform
- Create S3 bucket / Azure Storage
- Simple VPC / VNet creation (basic)
- Modify & update infrastructure
- Destroy infrastructure safely

➤ Ansible

➤ Introduction & Fundamentals

- What is Configuration Management?
- Why Ansible? Where it is used
- Ansible architecture (Control node & Managed nodes)
- Agentless architecture (SSH concept)
- Ansible installation & setup



Terraform



ANSIBLE

➤ Core Ansible Concepts

- Inventory file (static inventory)
- Hosts & groups
- Ansible configuration file (ansible.cfg)
- Modules (file, copy, yum, apt, service, user)
- Ad-hoc commands

➤ Playbooks & YAML

- Introduction to YAML
- Writing simple Ansible playbooks
- Tasks, handlers & variables
- Facts & conditionals (basic)
- Loops (basic)

➤ Hands-on Use Cases

- Install packages using Ansible
- Start/stop services
- Copy files to remote servers
- Configure web server (Apache / Nginx)
- Basic application

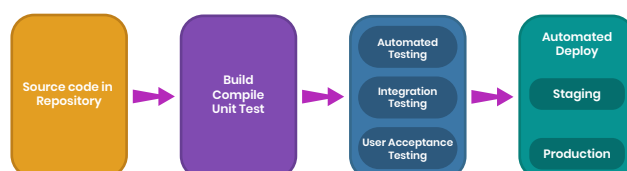


Module-5

DevOps with Cloud Integration

- CI/CD pipeline: Git + Maven + Jenkins + Docker + Kubernetes
- Deploy containerised app on AWS / Azure
- Monitoring basics (CloudWatch / Azure Monitor)
- DevOps best practices
- Real-time project walkthrough
- Internship mini project & demo

CI/CD PIPELINE



➤ Internship Outcomes

- Strong foundation in AWS, Azure & DevOps
- Hands-on experience with real tools
- Confidence to attend interviews
- Internship certificate & project experience
- Resume & LinkedIn profile guidance
- Free coupons for Microsoft/AWS certification Exams