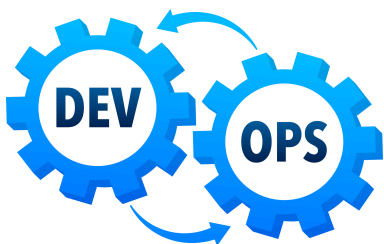




IDM TECHPARK
GUIDE'S FOR PERFECT CAREER PATHWAY



AWS Devops Course Syllabus



N.S.D.C
National
Skill Development
Corporation



1

About Us

IDMTECHPARK global retail & corporate training solutions provider in Coimbatore, Erode, Trichy & Salem that offers a comprehensive range of training and placement services for both fresher's and professionals seeking new opportunities. The company commenced its IT training business in 2016. A pioneer in IT education, over the years, we have trained over 50k students. Idmtechpark has a wide range of courses, maintains education standards & provides placement assistance.

www.idmtechparkcoimbatore.com
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+91 9585305700

**2**

About IDMTECHpark Education Quality

IDMTECHPARK is managed and developed by industry specialists with more than 8 years of expertise in the field. IDMTECHPARK offers a staff of highly skilled professional trainers who deliver effective IT training in a friendly setting, concentrating on the needs of each individual to help them succeed in a demanding work world. In the book of career and success, our staff never leaves a page unturned.

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IDMTECHPARK's versatile instructor-led training class rooms and lower-class sizes enable people to engage more easily and absorb knowledge, resulting in remarkable results for both themselves and the organizations for which they work. Our training programmes are adaptable and customizable to ensure that each participant gets the most out of their time with us. IDMTECHPARK focuses in providing hands-on IT training in over 30 different courses.

- We teach in-demand courses
- We provide impactful learning material
- Our teachers are well-selected & trained
- We follow world-class teaching methods
- Our courses include E-Projects
- We conduct technical workshops
- Exams are held and based on Exams providing Certification
- Certificates are recognized the world over
- Our course timings are flexible



3

Our Recent Placement

Idmtechpark assists students in getting job placements on successful completion of their courses. Idmtechpark also provides recruitment assistance to organizations. Idmtechpark students are shortlisted based on the organization's requirement. To make students job-ready, Idmtechpark conducts workshops e.g. How to do Group Discussions, how to behave in a Personal Interview. From time to time, job fairs & campus recruitments are conducted. Workplace skills such as time management, making effective presentations and communication skills are also provided. All this helps students find appropriate jobs in the IT industry while also helping save companies recruitment costs.

Krishnaveni M

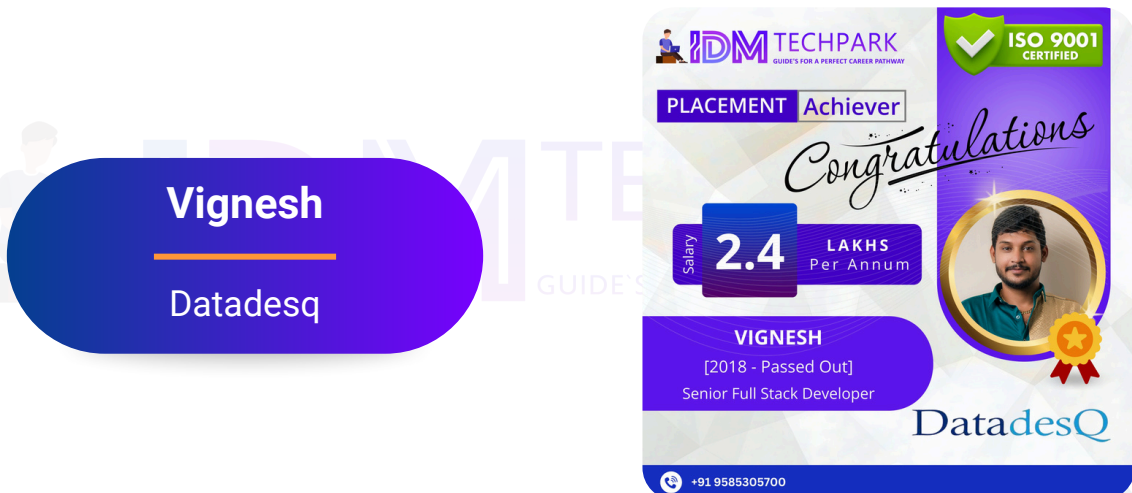
Frutterlabs





Joshwa

Xccessor



Vignesh

Datadesq



Madhumitha

Accenture

Keerthana

AJS



Brindha Boopathi

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Kavinkumar

AJS

Ajithkumar

AJS



Gowthami

Genpact



Surya

ZUCI

Pavithra

Vel Info Tech



Poovitha

Gray Matter



Ramesh

TDT

Siva Sankar
 ST Cloudspark tech



Nabeel Hisham
 VTail



Kalayarasan
 Violet Infotech

4

Our Alumni Working At



MODULE 1

Introduction to Cloud Computing and AWS

● What is Cloud Computing?

- ☐ Types of cloud services: IaaS, PaaS, SaaS
- ☐ Deployment models: Public, Private, Hybrid Cloud

● Introduction to AWS

- ☐ Overview of AWS and its global infrastructure
- ☐ Key AWS services and their uses
- ☐ Setting up an AWS account

MODULE 2

AWS Global Infrastructure

- AWS Regions, Availability Zones, and Edge Locations
 - Understanding AWS global architecture
 - Benefits of deploying applications across multiple regions
- Understanding Data Centers and Availability Zones
 - How AWS data centers ensure high availability and fault tolerance

MODULE 3

AWS Identity and Access Management (IAM)

● IAM Fundamentals

- ☐ Introduction to IAM and its importance in AWS security
- ☐ Creating and managing IAM users, groups, and roles

● IAM Policies and Permissions

- ☐ Writing and attaching IAM policies
- ☐ Best practices for IAM security

MODULE 4

AWS Elastic Compute Cloud (EC2)

● Introduction to EC2

- ☐ What is EC2 and its use cases
- ☐ EC2 instance types, families, and pricing models

● Launching and Managing EC2 Instances

- ☐ Configuring security groups, key pairs, and instance storage
- ☐ Connecting to EC2 instances via SSH (Linux) or RDP (Windows)

MODULE 5

Amazon Elastic Block Store (EBS)

● Overview of EBS

- ☐ What is EBS and its use in EC2 instances
- ☐ Different EBS volume types (SSD, HDD)

● Managing EBS Volumes

- ☐ Creating, attaching, and detaching volumes
- ☐ Snapshot and backup strategies

MODULE 6

Amazon Simple Storage Service (S3)

● Overview of S3

- ☐ What is S3 and its use cases
- ☐ S3 Buckets and Objects

● Managing Data in S3

- ☐ Uploading, downloading, and organizing data in S3
- ☐ S3 Access Control Lists (ACLs), Bucket Policies, and Encryption

MODULE 7

AWS Networking Basics

● VPC (Virtual Private Cloud) Overview

- Introduction to VPC, subnets, and route tables
- Public vs. private subnets and their use cases

● Security and Networking with AWS

- Setting up Network Access Control Lists (NACLs) and Security Groups

MODULE 8

AWS Route 53

● Introduction to Route 53

- ☐ DNS service in AWS: What is Route 53?
- ☐ Understanding DNS records (A, CNAME, MX, etc.)

● Managing Domain Names with Route 53

- ☐ Registering domains and routing traffic to AWS resources

MODULE 9

Elastic Load Balancing (ELB)

- Introduction to Load Balancers

- Types of Load Balancers in AWS: Classic, Application, Network

- Setting up and configuring an Elastic Load Balancer (ELB)

- Scaling with Load Balancers

- Load balancing traffic across EC2 instances

MODULE 10

Amazon Auto Scaling

● Introduction to Auto Scaling

- How Auto Scaling works and its benefits
- Setting up Auto Scaling groups and policies

● Scaling EC2 Instances Automatically

- Scaling based on metrics and thresholds
- Ensuring high availability and cost optimization with Auto Scaling

MODULE 11

AWS Lambda

● What is AWS Lambda?

- ☐ Introduction to serverless computing
- ☐ Key benefits of Lambda (no servers to manage, pay-per-use pricing)

● Creating and Managing Lambda Functions

- ☐ Writing and deploying Lambda functions in various languages (Python, Node.js, etc.)
- ☐ Triggering Lambda functions with events

MODULE 12

Amazon RDS (Relational Database Service)

● Overview of Amazon RDS

- Supported databases in RDS (MySQL, PostgreSQL, Oracle, etc.)

- Creating, managing, and scaling RDS instances

● Backup and Recovery in RDS

- Automated backups and database snapshots

- Restoring databases from snapshots

MODULE 13

Amazon DynamoDB

● Overview of DynamoDB

- ☐ What is DynamoDB and how it differs from RDS
- ☐ Use cases for NoSQL databases

● Managing DynamoDB Tables

- ☐ Creating and managing tables, indexes, and queries
- ☐ Provisioned and on-demand capacity modes

MODULE 14

Amazon SQS (Simple Queue Service) and SNS (Simple Notification Service)

● Overview of SQS

☐ What is SQS and how does it facilitate message queueing?

☐ Setting up and managing SQS queues

● Overview of SNS

☐ Introduction to SNS for pub/sub messaging

☐ Creating topics, subscriptions, and sending notifications

MODULE 15

AWS CloudWatch

● Overview of CloudWatch

☐ What is CloudWatch and how it helps with monitoring AWS resources

☐ Setting up CloudWatch Alarms

● Log Management and Metrics

☐ Configuring custom metrics and logging

☐ Analyzing logs with CloudWatch Logs

MODULE 16

AWS CloudFormation

● What is CloudFormation?

☐ Introduction to Infrastructure as Code (IaC)

☐ Benefits of using CloudFormation for resource management

● Creating CloudFormation Templates

☐ Writing YAML/JSON templates for AWS resource provisioning

☐ Deploying infrastructure with CloudFormation stacks

MODULE 17

AWS Elastic Beanstalk

- What is Elastic Beanstalk?
 - Introduction to PaaS in AWS
 - Deploying applications to Elastic Beanstalk
- Managing Environments
 - Configuring Elastic Beanstalk environments for scalability and performance
 - Monitoring and troubleshooting applications

MODULE 18

Amazon CloudFront

● What is CloudFront?

- ☐ Introduction to CDN (Content Delivery Network)
- ☐ Benefits of using CloudFront for global content delivery

● Setting Up CloudFront Distributions

- ☐ Configuring CloudFront to distribute static and dynamic content

MODULE 19

AWS Cost Management and Billing

● Understanding AWS Pricing

- Overview of AWS pricing models: Pay-as-you-go, Reserved, and Spot instances
- Cost estimation tools like AWS Pricing Calculator

● AWS Budgets and Cost Explorer

- Setting up budgets and tracking AWS usage
- Analyzing cost and usage with AWS Cost Explorer

MODULE 20

AWS Security Best Practices

● Securing AWS Resources

- ☐ Identity and Access Management (IAM) best practices
- ☐ Encrypting data in transit and at rest

● Monitoring Security

- ☐ Using AWS CloudTrail for auditing and logging user activity
- ☐ AWS Config for resource compliance

MODULE 21

AWS Developer Tools

● Introduction to Developer Tools

○ AWS CodeCommit, CodeBuild, CodeDeploy, and CodePipeline

○ Continuous Integration/Continuous Delivery (CI/CD) pipelines on AWS

● Setting Up CodePipeline

○ Building automated build, test, and deploy pipelines with AWS developer tools

MODULE 22

AWS Migration Services

● Introduction to Migration

- ☐ Why migrate workloads to AWS?
- ☐ Overview of AWS Migration Hub, Database Migration Service, Server Migration Service

● Planning and Executing Migrations

- ☐ Migrating databases and servers to AWS

MODULE 23

AWS Machine Learning Services

- Introduction to AWS AI/ML

- Overview of machine learning and artificial intelligence services on AWS

- Key services: Amazon SageMaker, Rekognition, Lex, Polly, Comprehend

- Building ML Models with SageMaker

- Training, testing, and deploying machine learning models using SageMaker

MODULE 24

Advanced Networking in AWS

- VPC Peering and Transit Gateway

- Setting up VPC peering and using AWS Transit Gateway

- Advanced Routing and Security

- Configuring VPNs, Direct Connect, and advanced VPC routing

MODULE 25

AWS Certification Preparation and Best Practices

● Preparing for AWS Certification

- Overview of AWS Certified Solutions Architect, Developer, and SysOps Administrator exams
- Study resources and exam preparation tips

● Best Practices for AWS Architecture

- Designing highly available, fault-tolerant, and cost-efficient systems on AWS
- Real-world architectural best practices and patterns

MODULE 26

Introduction to DevOps

● What is DevOps?

- ☐ Definition and principles of DevOps
- ☐ The importance of DevOps in modern software development

● DevOps Culture

- ☐ Collaboration between development and operations teams
- ☐ Key DevOps practices: Continuous Integration (CI), Continuous Delivery (CD), automation

MODULE 27

DevOps Lifecycle and Tools Overview

● DevOps Lifecycle

○ Phases of the DevOps lifecycle: Plan, Develop, Build, Test, Release, Deploy, Operate, Monitor

● Overview of DevOps Tools

○ Tools used at various stages of the DevOps lifecycle

○ Introduction to tools like Git, Jenkins, Docker, Kubernetes, Terraform, etc.

MODULE 28

Version Control with Git

● Introduction to Git

- ☐ Basics of version control systems (VCS)
- ☐ Git fundamentals: Cloning, committing, branching, and merging

● Git Workflow

- ☐ Git branching strategies: Git Flow, Feature branches, Master/Develop branches
- ☐ Collaboration with GitHub or GitLab

MODULE 29

Continuous Integration (CI)

● What is Continuous Integration?

- ☐ CI principles and its importance in DevOps
- ☐ Benefits of automating integration with CI

● Setting up CI with Jenkins

- ☐ Installing and configuring Jenkins
- ☐ Building and automating a simple CI pipeline

MODULE 30

Continuous Delivery (CD)

● What is Continuous Delivery?

- ☐ Difference between CI and CD
- ☐ Benefits of automating delivery pipelines

● Setting up CD Pipeline

- ☐ Integrating Jenkins with Docker for deployment automation
- ☐ Automated testing in the delivery pipeline

MODULE 31

Configuration Management with Ansible

● Introduction to Configuration Management

- Importance of managing infrastructure as code (IaC)
- Overview of tools: Ansible, Chef, Puppet, and SaltStack

● Using Ansible for Automation

- Writing simple playbooks
- Managing servers and infrastructure using Ansible

MODULE 32

Infrastructure as Code (IaC) with Terraform

● What is Infrastructure as Code?

- ☐ Principles of IaC and its role in DevOps
- ☐ Benefits of declarative vs. imperative infrastructure

● Using Terraform

- ☐ Writing Terraform configuration files
- ☐ Provisioning resources in AWS or Azure using Terraform

MODULE 33

Containerization with Docker

● Introduction to Containers

☐ What is containerization, and how does Docker fit into the DevOps ecosystem?

☐ Docker architecture and components: Images, Containers, Docker Hub

● Using Docker

☐ Creating, managing, and deploying Docker containers

☐ Building custom Docker images using Dockerfile

MODULE 34

Docker Compose

● Introduction to Docker Compose

○ What is Docker Compose and why is it useful for multi-container applications?

○ Writing and managing multi-container applications using docker-compose.yml

● Orchestrating Multi-Container Applications

○ Deploying and scaling applications with Docker Compose

MODULE 35

Container Orchestration with Kubernetes

● Introduction to Kubernetes

- Kubernetes architecture: Pods, Nodes, Clusters, Deployments, Services

- Key concepts: Namespaces, ConfigMaps, Secrets, Persistent Volumes

● Deploying Applications with Kubernetes

- Setting up Kubernetes clusters (Minikube, Kubernetes in the cloud)

- Deploying apps, scaling, and managing containerized applications

MODULE 36

Kubernetes Networking and Service Discovery

● Understanding Kubernetes Networking

- ☐ Pod networking, ClusterIP, NodePort, LoadBalancer
- ☐ Service discovery and DNS in Kubernetes

● Configuring Networking in Kubernetes

- ☐ Ingress Controllers, Network Policies

MODULE 37

Monitoring and Logging with Prometheus and Grafana

● Introduction to Monitoring

- ☐ The role of monitoring in DevOps
- ☐ Overview of Prometheus: Metrics collection and alerting

● Setting up Grafana for Visualization

- ☐ Integrating Prometheus with Grafana for real-time dashboards
- ☐ Creating alerts and monitoring system health in Kubernetes

MODULE 38

Continuous Testing in DevOps

● What is Continuous Testing?

- ☐ The importance of automated testing in the DevOps pipeline
- ☐ Types of tests: Unit, Integration, System, and Acceptance tests

● Integrating Testing with CI/CD

- ☐ Tools for Continuous Testing: Selenium, JUnit, TestNG, and others
- ☐ Automating testing in Jenkins pipelines

MODULE 39

Continuous Deployment vs. Continuous Delivery

● CD vs. CD (Continuous Deployment)

☐ Differences between Continuous Delivery and Continuous Deployment

☐ Use cases and when to choose one over the other

● Implementing Continuous Deployment

☐ Configuring fully automated production deployments

☐ Blue/Green and Canary deployments

MODULE 40

AWS DevOps Services

- AWS DevOps Tools Overview

- AWS services for DevOps: CodeCommit, CodeBuild, CodeDeploy, CodePipeline, CloudFormation

- Automating Deployment on AWS

- Integrating AWS services for a complete DevOps workflow

MODULE 41

CI/CD Pipelines in Cloud Environments

● CI/CD on AWS

☐ Setting up CI/CD pipelines using AWS CodePipeline and CodeBuild

● CI/CD on Azure

☐ Setting up CI/CD pipelines using Azure DevOps services

● CI/CD on Google Cloud

☐ Google Cloud Build and Google Kubernetes Engine (GKE)

MODULE 42

DevSecOps: Integrating Security into DevOps

● What is DevSecOps?

- ☐ Shifting security left in the DevOps process
- ☐ Security testing and compliance in the CI/CD pipeline

● Tools for DevSecOps

- ☐ Integrating tools like SonarQube, OWASP ZAP, and Snyk into the pipeline
- ☐ Vulnerability scanning in containerized environments

MODULE 43

DevOps for Microservices

● Introduction to Microservices Architecture

- ☐ What are microservices, and how does DevOps help in their management?
- ☐ Benefits of using microservices in DevOps workflows

● Deploying Microservices

- ☐ Managing microservices using Docker, Kubernetes, and CI/CD pipelines

MODULE 44

Serverless DevOps with AWS Lambda

● What is Serverless Computing?

- ☐ Overview of serverless architecture and its benefits
- ☐ AWS Lambda, AWS API Gateway, and AWS Step Functions

● Building Serverless Applications

- ☐ Deploying serverless applications and integrating them into DevOps pipelines

MODULE 45

Automation with Jenkins

● Jenkins for CI/CD

☐ Overview of Jenkins for continuous integration and delivery

☐ Jenkins pipeline creation, management, and monitoring

● Advanced Jenkins Features

☐ Jenkins shared libraries, managing Jenkins at scale, and using Jenkins plugins

MODULE 46

Agile and DevOps

● DevOps and Agile Methodologies

- ☐ How Agile and DevOps complement each other
- ☐ Incorporating DevOps practices into Agile sprints

● Agile Development and Continuous Delivery

- ☐ CI/CD in Agile workflows: Frequent releases, automated testing

MODULE 47

Configuration as Code with Puppet and Chef

- Introduction to Puppet and Chef

- Configuration management with Puppet and Chef
 - How Puppet and Chef compare with Ansible and Terraform

- Managing Infrastructure with Puppet/ Chef

- Setting up Puppet or Chef environments and writing manifests/recipes

MODULE 48

Advanced Topics in Kubernetes

● Kubernetes Security

- ☐ Securing Kubernetes clusters and best practices for Kubernetes security
- ☐ Role-based access control (RBAC), network policies

● Advanced Kubernetes Deployments

- ☐ Helm charts for Kubernetes applications
- ☐ StatefulSets, persistent storage, and multi-cluster deployments

MODULE 49

Advanced Cloud Infrastructure Management

● Cloud-Native Infrastructure

○ Managing infrastructure at scale in the cloud with Kubernetes, Terraform, and Docker

● Multi-Cloud and Hybrid Cloud in DevOps

- Managing workloads across multiple cloud providers
- Multi-cloud DevOps pipelines and tools integration

MODULE 50

Capstone Project: DevOps Implementation

● Capstone Project Overview

- Building a full-stack application and deploying it through a complete DevOps pipeline
- Setting up CI/CD, infrastructure as code (IaC), automated testing, monitoring, and security

● Project Presentation and Review

- Reviewing and presenting the DevOps project
- Evaluating the scalability, performance, and security of the project

Thank You

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