**11.Aws Syllabus**

**(Name : V.Dinesh Kumar, Duration : 12weeks – 120 Hours, lessons - 16)**

Here’s a **general employability-focused syllabus for AWS (Amazon Web Services)**, designed to prepare you for roles like **Cloud Engineer**, **AWS Solutions Architect**, **DevOps Engineer**, or **Cloud Administrator**. The syllabus aligns with the **AWS Certified Solutions Architect – Associate (SAA-C03)** and other related certifications, focusing on practical and real-world skills.

**Topics Covered:**

**1. Introduction to Cloud Computing and AWS**

* Basics of Cloud Computing
* Definition and Characteristics (On-Demand, Scalability, Pay-as-You-Go)
* Cloud Deployment Models (Public, Private, Hybrid)
* Cloud Service Models (IaaS, PaaS, SaaS)
* Introduction to AWS
* AWS Global Infrastructure (Regions and Availability Zones)
* Key AWS Services Overview
* AWS Free Tier and Billing Concepts

**2. AWS Identity and Access Management (IAM)**

* IAM Concepts
* Users, Groups, Roles, and Policies
* IAM Best Practices (Least Privilege Principle)
* IAM Policy Types and Examples
* Multi-Factor Authentication (MFA) Configuration
* AWS Organizations and Service Control Policies (SCP)
* Cross-Account Access and Federation

**3. Amazon Elastic Compute Cloud (EC2)**

* Introduction to EC2 Instances
* Instance Types and Pricing Models (On-Demand, Reserved, Spot, Dedicated)
* AMIs (Amazon Machine Images)
* Instance Configuration and Launch
* EC2 Networking and Security
* Elastic IPs and ENIs
* Security Groups and Network ACLs
* Instance Monitoring and Troubleshooting
* CloudWatch and CloudTrail Integration
* Auto Scaling and Load Balancing
* Elastic Load Balancer (ELB) Configuration
* Auto Scaling Groups (ASG) and Policies

**4. AWS Storage Services**

* Amazon S3 (Simple Storage Service)
* Buckets, Objects, and Versioning
* Storage Classes (Standard, Glacier, Intelligent-Tiering)
* S3 Lifecycle Policies and Data Management
* EBS (Elastic Block Store)
* Volume Types (General Purpose SSD, Provisioned IOPS SSD, Magnetic)
* Snapshot and Backup Strategies
* EFS (Elastic File System)
* Shared File Storage Configuration
* AWS Backup and Data Recovery Strategies
* AWS Storage Gateway and Snow Family for Hybrid Storage

**5. AWS Networking and Content Delivery**

* Amazon VPC (Virtual Private Cloud)
* Subnets, Route Tables, and Internet Gateways
* NAT Gateways and Bastion Hosts
* VPC Peering and Transit Gateway
* VPN and Direct Connect Configuration
* Route 53 (DNS and Domain Registration)
* Routing Policies and Health Checks
* AWS Global Accelerator and CloudFront (CDN)

**6. Databases on AWS**

* Relational Databases with RDS
* Engine Options (MySQL, PostgreSQL, Aurora, Oracle, SQL Server)
* Multi-AZ and Read Replicas
* Backup and Point-in-Time Recovery
* NoSQL with DynamoDB
* Tables, Items, and Attributes
* Indexes and Querying
* Data Warehousing with Redshift
* Caching with ElastiCache (Redis and Memcached)
* Database Migration Service (DMS)

**7. AWS Compute and Serverless**

* AWS Lambda
* Creating and Deploying Lambda Functions
* Integrating Lambda with Other AWS Services
* Lambda Triggers and Event Sources
* AWS Fargate and ECS (Elastic Container Service)
* Container Orchestration with ECS and EKS (Kubernetes)
* Docker Image Management with ECR (Elastic Container Registry)
* AWS Batch for Batch Processing
* AWS App Runner and Elastic Beanstalk

**8. Monitoring and Logging**

* AWS CloudWatch
* Metrics, Alarms, and Dashboards
* Logs and Log Groups
* Custom Metrics and Alarms
* AWS CloudTrail for Audit and Compliance
* AWS Config for Configuration Monitoring
* VPC Flow Logs and Network Monitoring

**9. Security and Compliance**

* AWS Shared Responsibility Model
* Data Encryption with AWS KMS
* AWS Shield and WAF for DDoS Protection
* GuardDuty for Threat Detection
* Security Hub and AWS Inspector for Vulnerability Scanning
* Secrets Manager and Parameter Store for Credential Management

**10. AWS Automation and DevOps**

* Infrastructure as Code (IaC) with AWS CloudFormation
* Writing CloudFormation Templates (YAML/JSON)
* Stack Creation and Updating
* AWS CLI and SDKs for Automation
* AWS Systems Manager (SSM) for Fleet Management
* AWS CodePipeline, CodeBuild, CodeDeploy, and CodeCommit
* Continuous Integration and Deployment (CI/CD) Best Practices

**11. AWS Big Data and Analytics**

* Amazon EMR (Elastic MapReduce) for Big Data Processing
* AWS Glue for ETL (Extract, Transform, Load)
* AWS Athena for SQL Queries on S3
* Kinesis for Real-Time Data Processing
* Amazon QuickSight for Data Visualization

**12. Artificial Intelligence and Machine Learning**

* AWS SageMaker for Building and Training Models
* AWS Rekognition for Image and Video Analysis
* AWS Comprehend for Natural Language Processing
* AWS Lex for Conversational Bots
* Personalization and Forecasting with AWS AI Services

**13. AWS Application Integration**

* Simple Notification Service (SNS)
* Simple Queue Service (SQS)
* AWS Step Functions for Workflow Automation
* EventBridge for Event-Driven Architectures
* API Gateway for RESTful API Hosting

**14. Real-World Projects and Capstone**

* **Project 1:** Deploying a Web Application with EC2 and RDS
* **Project 2:** Automating Infrastructure with CloudFormation
* **Project 3:** Real-Time Data Processing with Kinesis and Lambda
* **Project 4:** Building a Serverless Chatbot with Lex and Lambda
* **Project 5:** Setting Up a CI/CD Pipeline with CodePipeline

**15. AWS Certification Preparation**

* **AWS Certified SysOps Administrator – Associate**
* **AWS Certified DevOps Engineer – Professional**
* Practice Exams and Mock Tests
* Real-Life Scenarios and Troubleshooting Labs

**16. Soft Skills and Interview Preparation**

* Cloud Cost Optimization Techniques
* Writing Effective AWS Solution Documentation
* Troubleshooting and Root Cause Analysis
* Mock Interviews and Problem-Solving Scenarios

**Educational Background**

* **Bachelor’s Degree in:**
* **BE / B.Tech / B.Sc / BCA in CS, IT, or Networking**
* **Master’s Degree**
* **MCA / M.Tech in Systems, Networking, Cloud**