

CSC301:INTRODUCTION TO CLOUD COMPUTING

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: define key cloud computing concepts, AWS architecture, and services like EC2 and S3

CO2 :: explain AWS tools (IAM, CloudTrail, CloudWatch) for authentication and monitoring

CO3 :: demonstrate VPC configuration, secure access controls, and EC2 management using AWS CLI

CO4 :: compare AWS storage solutions and databases for scalability and use cases

CO5 :: evaluate system reliability and security using auto-scaling, backup, and security tools

CO6 :: design secure, resilient cloud architectures using AWS principles and services

Unit I

Introduction to cloud Computing and AWS : Cloud Computing and Virtualization, Cloud Computing Architecture, Cloud computing optimization, AWS Platform Architecture, AWS Reliability and Compliance, Working with AWS CLI

Amazon EC2 and Amazon EBS : Introduction to EC2, Configure Instance Behavior, Placement Groups, Instance Pricing, Instance Lifecycle, Resource Tags, Service Limits, EC2 Storage volumes, Instance store Volumes, Accessing Your EC2 Instance, Securing Your EC2 Instance, EC2 Auto Scaling, AWS System Manager, AWS CLI Examples

Unit II

AWS Storage : S3 Service Architecture, S3 Durability and Availability, S3 Object Lifecycle, Accessing S3 Objects, Amazon S3 Glacier, Amazon Elastic File System, Amazon FSx, AWS Storage Gateway

Amazon Virtual Private Cloud : VPC CIDR Blocks, Subnets, Availability Zones, Elastic Network Interfaces, Primary and Secondary Private IP Addresses, Attaching Elastic Network Interfaces, Internet Gateway, Route Table, Security Group, Network Access Control List, Elastic IP Addresses, AWS Global Accelerator, Network Address Translation, VPC Peering, Hybrid Cloud Networking

Unit III

Database Services : Introduction Relational Databases, Amazon Relational Database, Database Engines, Licensing Consideration, Database Option groups, Database Instance classes, Storage, Read Replicas, High Availability, Single Master, Multi Master service, Amazon Redshift, Nonrelation Database, DynamoDB

Unit IV

Authentication and Authorization – AWS (IAM) : Introduction to IAM, IAM Identities, IAM Policies, IAM Users, IAM Groups, IAM Roles, Authentication Tools, Amazon Cognito, AWS Managed Microsoft AD, AWS single Sign-on, AWS Key Management Service, AWS Secrets Manager, AWS Cloud HSM

CloudTrail, CloudWatch, and AWS Config : : Introduction, CloudTrail, Management Events, Data Events, Event History, Trails, Log File Integrity Validation, CloudWatch, CloudWatch Metrics, Graphing Metrics, Metric Match, CloudWatch Logs, CloudWatch Alarms, Amazon Event Bridge, AWS Config, Configuration Recorder, Configuration Items, Configuration History, Configuration Snapshots, Monitoring Changes

Unit V

The DNS and Network Routing : Introduction to Domain Name System (AWS), Amazon Route 53, Domain Registration, DNS Management, Availability Monitoring, Routing Policies, Traffic Flow, Route 53 Resolver, Amazon CloudFront

The Reliability Pillar : Calculating Availability, Cloud-Native Application, EC2 Auto Scaling, Launch Configuration, Launch Templates, Auto Scaling Groups, Auto Scaling Options, Data Backup and Recovery, Elastic File System, Elastic Block Storage, Data Resiliency, Creating Resilient Network, External Connecting, Designing for Availability

Unit VI

The Security Pillar : Introduction to Identity and Access management, Protecting AWS credentials, Fine-grained Authorization, Permission Boundaries, Roles, Enforcing Service-Level Protection, Detective Controls, CloudTrail, CloudWatch Logs, searching Logs with Athena, Auditing Resource Configuration, Amazon GuardDuty, Amazon Inspector, Amazon Detective, Security Hub, Protecting Network Boundaries, Data Encryption

References:

1. AWS CERTIFIED SOLUTIONS ARCHITECT OFFICIAL: ASSOCIATE EXAM by JOE BARON, HISHAM BAZ, TIM BIXLER, BIFF GAUT, KEVIN E. KELLY, SYBEX
2. AWS CERTIFIED SOLUTIONS ARCHITECT – ASSOCIATE GUIDE: THE ULTIMATE EXAM GUIDE TO AWS SOLUTIONS ARCHITECT CERTIFICATION by GABRIEL RAMIREZ, STUART SCOTT, PACKT PUBLISHING