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Course Title: Cloud Computing: Master AWS from Scratch

Duration: 4-6 Weeks

Who it is for: Pursuing B.Tech/B.E./MCA/M.Tech/BCA/M.Sc(IT)/B.Sc(IT)

Mode of Training: Live, Online, Instructor Led

Access to Recording: Yes

Pre-Requisite: No Pre-requisite, Concepts would be built from Scratch

Teaching Methodology: No to Minimum theory, maximum Hands on. Object oriented; problem driven.

Doubt Session: Weekly Doubt Session to ensure no one is left behind

Certificate: Industry Endorsed Certificate (Jointly Signed By Our Primary Industry Partner)

Project:

- 1) Module Specific 3-4 Mini-Project.
- 2) Hand On Major Project
- 3) Sample Project
- 4) Capstone Project

Teaching Approach:

- **Interactive Lectures:** For concept clarity.
- **Hands-On Labs:** Real World Simulated datasets and exercises.
- **Capstone Project:** Integration of all tools and concepts.
- **Feedback Sessions:** Instructors review and guide project presentations.

Course Objectives:

1. Develop a foundational understanding of cloud computing principles and AWS architecture, including its core services such as EC2, S3, and RDS.
2. Equip learners with hands-on skills to design, deploy, and manage scalable, secure, and cost-effective cloud solutions on AWS.
3. Explore real-world applications of AWS in industries like e-commerce, finance, and healthcare, while mastering best practices in cloud adoption.
4. Prepare participants for AWS certifications and roles in cloud computing by providing practical insights and problem-solving techniques.

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Module 1: Introduction to Cloud Computing (6 hours)

1. What is Cloud Computing? (2 hour)

- Definition, characteristics, and benefits.
- Cloud service models: IaaS, PaaS, SaaS.
- Deployment models: Public, Private, Hybrid.

2. Introduction to AWS (2 hours)

- Overview of AWS services.
- AWS global infrastructure.
- Setting up an AWS account.

3. Cloud Computing Use Cases (1 hour)

- Real-world applications of cloud computing.

4. AWS Management Console (1 hour)

- Navigating the AWS Management Console.
- Overview of AWS CLI and SDKs.

Module 2: Core AWS Services (18 hours)

1. Compute Services (5 hours)

- Amazon EC2: Instances, AMIs, and pricing.
- Launching an EC2 instance.
- Hosting Website using EC2 instance
- AWS Lambda: Serverless computing.
- Creating a Lambda function.
- Integrating Lambda with API Gateway.
- Elastic Beanstalk: Simplified application deployment.

2. Storage Services (5 hours)

- Amazon S3: Buckets, objects storage
- Creating and managing S3 buckets.
- Configuring an S3 bucket for static website hosting.
- Amazon EBS: Block storage for EC2.
- Amazon Glacier: Archival storage.

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- Data lifecycle policies.

3. **Networking Services** (4 hours)

- Amazon VPC: Subnets, route tables, and security groups.
- Elastic Load Balancing and Auto Scaling.

4. **Database Services** (4 hours)

- Amazon RDS: Relational databases.
- Launching an RDS database instance.
- Amazon DynamoDB: NoSQL databases.
- Setting up a DynamoDB table.
- Introduction to Amazon Redshift and Elastic Cache.

Module 3: Security and Identity Management (5 hours)

1. **AWS Identity and Access Management (IAM)** (3 hours)

- AWS Shared Responsibility Model.
- Users, groups, roles, and policies.
- Creating and managing IAM users and policies.
- Enabling Multi-Factor Authentication (MFA).

2. **AWS Security Services** (1 hours)

- AWS Shield, WAF, and GuardDuty.
- Encryption and key management with AWS KMS.

3. **Compliance and Governance** (1 hour)

- AWS compliance programs and shared responsibility model.

Module 4: Monitoring and Optimization (5 hours)

1. **Monitoring AWS Resources** (3 hours)

- Amazon CloudWatch: Metrics, logs, and alarms.
- AWS CloudTrail: Tracking API activity.
- AWS Trusted Advisor and its benefits.
- Setting up a CloudWatch alarm.
- Reviewing logs using CloudTrail.

2. **Cost Management** (1 hours)

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- AWS Pricing Calculator.
- Cost Explorer and billing alerts.

3. **Performance Optimization** (1 hour)

- Best practices for scaling and optimizing AWS resources.

Module 5: High Availability and Fault Tolerance (2 hours)

- Designing for High Availability.
- Disaster Recovery strategies.
- Elastic Load Balancer (ELB) and Auto Scaling deep dive.
- Implementing Auto Scaling for a web application.

Module 6: Working with API Gateway (2 hours)

- Amazon API Gateway Concept
- Integrating Lambda with API Gateway.

Module 7: Advanced AWS Services (4 hours)

1. **Machine Learning and AI** (2 hours)

- Amazon SageMaker: Building and deploying ML models.
- AWS AI services: Rekognition, Polly, and Lex.

2. **DevOps on AWS** (2 hours)

- AWS CodePipeline, CodeBuild, and CodeDeploy.

Module 8: Hands-On Projects and Case Studies (10 hours)

1. **Project 1: Deploying a Web Application** (3 hours)

- Using EC2, S3, and RDS.

2. **Project 2: Building a Serverless Application** (3 hours)

- Using AWS Lambda, API Gateway, and DynamoDB.

3. **Case Studies** (4 hours)

- Real-world examples of AWS implementations.