CLOUD FUNDAMENTALS FOR DATA & AI – 2025 EDITION

" Build your AI & Data skills on the cloud."

Market Demand Note

Cloud computing is the backbone of modern data and AI solutions. From storing large datasets to running AI models at scale, cloud skills are now mandatory for tech professionals. This program introduces participants to the fundamentals of cloud services with a focus on data and AI workloads.

Duration: 6 weeks | **Mode**: Online/Offline

📘 Cloud Fundamentals for Data & AI — 2025 Edition

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Detailed Content

Week 1: Cloud Basics

- **What is cloud computing?**
  Computing resources (servers, storage, databases, apps) delivered over the internet on demand.

- **Key benefits:**

    - **Scalability: Easily scale up/down as needed.**

    - **Cost-effective: Pay only for what you use.**

    - **Reliability: High uptime, backups, disaster recovery.**

    - **Accessibility: Access from anywhere with internet.**

- **Key challenges:**

    - **Security concerns.**

    - **Potential for unexpected costs.**

    - **Vendor lock-in risks.**

- **Overview of AWS, Azure, GCP:**

    - **AWS (Amazon Web Services): Largest, broadest service catalog.**

    - **Azure: Deep Microsoft integration, enterprise focus.**

    - **GCP (Google Cloud Platform): Strong in data, analytics, AI.**

- **Hands-on:**

    - **Create free-tier accounts on AWS, Azure, GCP.**

    - **Navigate each provider's dashboard.**

    - **Compare service offerings.**

Week 2: Storage & Databases in the Cloud

- **Cloud storage options:**
    - **AWS S3: Object storage for files, images, backups.**
    - **GCP Storage: Comparable to S3, integrates with Google tools.**
    - **Azure Blob Storage: Microsoft's scalable object storage.**
- **Uploading, retrieving, and organizing datasets:**
    - **Upload files via UI or API (boto3 for AWS, gsutil for GCP, Azure CLI for Azure).**
    - **Organize data with folders/buckets.**
    - **Set permissions for security.**
- **Hands-on:**
    - **Upload, download, and organize a dataset on each platform.**
    - **Practice setting permissions and versioning.**

Week 3: Compute Services

- **Virtual machines (VMs):**
    - **AWS EC2, Azure VMs, GCP Compute Engine:**
      Spin up Linux/Windows servers in minutes.
- **Containers:**
    - **AWS ECS/EKS, Azure Container Instances, GCP Kubernetes Engine:**
      Deploy and manage containerized apps.
- **Serverless:**
    - **AWS Lambda, Azure Functions, GCP Cloud Functions:**
      Run code without managing servers.
- **Running Python scripts:**
    - **Deploy a Python script on a VM, container, and serverless function.**
- **Hands-on:**
    - **Launch a VM, deploy a container, and run a serverless Python script on each cloud.**
    - **Compare startup time, cost, and ease of use.**

Week 4: AI Services in the Cloud

- **Pre-built AI services:**

    - **Vision: AWS Rekognition, Azure Computer Vision, GCP Vision.**

    - **NLP: AWS Comprehend, Azure Language Service, GCP Natural Language.**

    - **Speech: AWS Transcribe, Azure Speech, GCP Speech-to-Text.**

- **Running a basic ML model:**

    - **AWS SageMaker, Azure ML, GCP AI Platform: Train, deploy, and manage ML models.**

- **Hands-on:**

    - **Use a pre-built AI service (e.g., analyze sentiment of text, detect objects in images).**

    - **Train and deploy a simple ML model (e.g., linear regression) on each platform.**

Week 5: Security & Cost Management

- **Identity & Access Management (IAM):**

    - **AWS IAM, Azure RBAC, GCP IAM: Control who can access what in your cloud.**

    - **Best practices: Least privilege, audit logs, multifactor auth.**

- **Monitoring costs and optimizing resources:**

    - **AWS Cost Explorer, Azure Cost Management, GCP Billing Reports: Track spend, set budgets, alerts.**

    - **Optimization: Right-sizing, auto-scaling, spot/preemptible instances.**

- **Hands-on:**

    - **Set up IAM policies.**

    - **Use cost dashboards to monitor and optimize a project.**

Week 6: Final Project – Cloud-Hosted Sentiment Analysis App

- **Project Goal: Host a text sentiment analysis model on a cloud service.**

- **Tasks:**

1. **Store dataset in cloud storage (AWS S3, Azure Blob, GCP Storage).**

2. **Train or host a pre-trained sentiment model on AWS SageMaker, Azure ML, or GCP AI Platform.**

3. **Expose the model via a web API for real-time predictions.**

4. **Document the workflow and present your app.**

- **Output:**
  A cloud-hosted AI application with code, architecture diagram, and demo.

Tools Covered

- **AWS: S3, EC2, SageMaker, Lambda**

- **GCP: Storage, Compute Engine, AI Platform, Cloud Functions**

- **Azure: Blob Storage, VMs, Machine Learning, Functions**

- **Jupyter Notebook, Google Colab (for prototyping and documentation)**