**SRE Development Plan: Month 3 Review**

This month establishes foundational knowledge in two essential areas for any aspiring SRE: databases and cloud computing.

**Weeks 9-10: Relational Databases (SQL)**

* **Core Focus:** This section introduces relational database concepts, the SQL language for data manipulation, and fundamental administration tasks from an SRE perspective. Key topics include performance monitoring (query analysis), optimization basics (indexing), and reliability practices (backups, replication basics).
* **Key Activity:** A hands-on project requires participants to build a simple database application using CRUD operations and analyze the performance of their queries.

**Weeks 11-12: Cloud Computing Basics**

* **Core Focus:** This part introduces one or more major cloud platforms (AWS/Azure/GCP). It moves beyond simple service introductions to cover essential practical concepts like cloud networking (VPCs, security groups), identity management (IAM), the importance of centralized logging, and basic cost awareness.
* **Key Activity:** A lab focused on deploying a basic application to the chosen cloud platform, ensuring logs are correctly captured, and emphasizing the creation of reproducible (ephemeral) environments.
* **Recommendation:** The plan also suggests encouraging participants to pursue foundational cloud certifications to validate their learning.

**Daily Training Plan: Month 3 (Beginner Focus)**

Here’s a possible day-by-day breakdown for the four weeks:

**Part 1: Databases (Weeks 9-10)**

**Week 9: Relational Database Fundamentals & SQL Basics**

* **Day 1:** What is a Relational Database? (Tables, Columns, Rows, Primary Keys, Foreign Keys). Intro to SQL. Basic SELECT queries. *Lab: Connect to a sample database and run simple SELECTs.*
* **Day 2:** Data Manipulation Language (DML): INSERT, UPDATE, DELETE. *Lab: Practice adding, modifying, and removing data.*
* **Day 3:** Database Design Principles: Normalization (1NF, 2NF). Why structure matters. *Activity: Design a simple schema for a small application (e.g., blog posts).*
* **Day 4:** Querying Related Data: SQL JOIN types (INNER, LEFT). *Lab: Write queries joining multiple tables.*
* **Day 5:** Aggregating Data: COUNT, SUM, AVG, MIN, MAX, GROUP BY, HAVING. *Lab: Write queries to summarize data. Kick off CRUD project: Finalize schema.*

**Week 10: Database Administration & SRE Concerns**

* **Day 6:** Basic DB Admin: User accounts, permissions/privileges. SRE Perspective: Why database availability and performance are critical.
* **Day 7:** Performance Tuning Introduction: What are Indexes? How do they speed up queries? Using EXPLAIN (or equivalent) to understand query execution. *Lab: Add indexes to tables and observe performance changes.*
* **Day 8:** Reliability - Backups: Why backups are essential. Types of backups (full, incremental). *Lab: Perform a manual database backup and restore.*
* **Day 9:** Reliability - Replication Introduction: Basic concept (master-slave/primary-replica). High Availability overview. *Discussion: How replication helps reliability.*
* **Day 10:** Project Work: Build the CRUD application interface (can be a simple command-line tool or basic web interface). Implement performance analysis (EXPLAIN) on project queries. *Demo: Showcase the working CRUD app and explain performance findings.*

**Part 2: Cloud Fundamentals (Weeks 11-12)**

**Week 11: Core Cloud Concepts & Services**

* **Day 11:** What is Cloud Computing? (IaaS, PaaS, SaaS). Overview of a chosen provider (e.g., AWS). Key benefits (scalability, elasticity). Cost Management Introduction.
* **Day 12:** Core Compute & Storage: Virtual Machines (e.g., EC2), Object Storage (e.g., S3). *Lab: Launch a basic VM instance.*
* **Day 13:** Cloud Networking: Virtual Private Cloud (VPC), Subnets, Security Groups/Firewalls. *Lab: Set up a basic VPC and configure security group rules to allow specific traffic (e.g., SSH, HTTP).*
* **Day 14:** Identity & Access Management (IAM): Users, Groups, Roles, Policies. Principle of Least Privilege. *Lab: Create an IAM user with limited permissions.*
* **Day 15:** Cloud Monitoring & Logging: Importance of observability. Overview of native monitoring services (e.g., CloudWatch). *Lab Kick-off: Plan the deployment of a simple web application.*

**Week 12: Cloud Deployment & Best Practices**

* **Day 16:** Deploying to the Cloud: Manually deploying the simple web application onto the VM created earlier. Accessing the application.
* **Day 17:** Centralized Logging: Configuring the application or VM agent to send logs to the cloud provider's logging service (e.g., CloudWatch Logs). *Lab: View and search application logs in the central service.*
* **Day 18:** Ephemeral Infrastructure: Concept of treating infrastructure as disposable and rebuildable. Brief introduction to Infrastructure as Code (IaC) - what it is, why it's used.
* **Day 19:** Cost Management Practice: Using the cloud provider's tools to view costs. Setting up billing alerts or budgets. *Discussion: Common cost pitfalls.*
* **Day 20:** Final Lab Review & Cloud Certification Path: Review the deployed application and logging setup. Discuss next steps and the value of foundational cloud certifications (e.g., AWS Cloud Practitioner, Azure Fundamentals). Recap Month 3.