

Google Cloud Professional Database Engineer

Course Duration: 40 Hours

Course code: GCPDE

1. Course Overview

During this five-day course, you will focus on designing, implementing, and managing database solutions on Google Cloud Platform (GCP). You will learn how to work with both relational and non-relational databases, optimize performance, ensure high availability, and implement secure and scalable database architectures. The course also covers migration strategies, monitoring, and automation for modern cloud-based database systems.

2. What you'll learn?

By the end of the course, you will be able to:

- Describe Google Cloud database services and their use cases
- Design scalable and highly available database solutions on GCP
- Manage relational databases using Cloud SQL and AlloyDB
- Work with NoSQL databases such as Firestore, Bigtable, and Datastore
- Implement database migration strategies using Database Migration Service
- Optimize database performance and cost
- Implement security best practices for GCP databases
- Monitor, troubleshoot, and automate database operations

3. Target Audience

This course is ideal for:

- Database engineers and administrators
- Cloud engineers and architects
- DevOps professionals
- Data engineers and backend developers

- IT professionals working with database systems

4. Pre-Requisites

Before taking this course, you should have:

- Basic knowledge of databases (SQL & NoSQL)
- Understanding of cloud computing concepts
- Familiarity with Google Cloud fundamentals (recommended)
- Experience with Linux command line and scripting (preferred)

5. Course content

Module 1: Course Introduction

- Course overview and objectives
- Understanding certification path
- Google Cloud database engineer role

Module 2: Google Cloud Database Services Overview

- Overview of GCP database ecosystem
- Relational vs NoSQL databases
- Choosing the right database service
- Introduction to managed vs self-managed databases

Module 3: Cloud SQL and AlloyDB

- Introduction to Cloud SQL
- Managing MySQL, PostgreSQL, and SQL Server
- Introduction to AlloyDB for PostgreSQL
- High availability and failover configurations
- Backup and recovery strategies

Module 4: Spanner – Globally Distributed Databases

- Introduction to Cloud Spanner

- Architecture and use cases
- Schema design and scaling
- Consistency and transactions
- Performance optimization

Module 5: NoSQL Databases on GCP

- Introduction to Firestore and Datastore
- Working with Bigtable
- Data modeling for NoSQL
- Use cases and performance considerations

Module 6: Database Migration Strategies

- Introduction to Database Migration Service (DMS)
- Homogeneous and heterogeneous migrations
- Planning and executing migrations
- Minimizing downtime
- Validation and testing

Module 7: Performance Optimization

- Query optimization techniques
- Indexing strategies
- Monitoring query performance
- Scaling databases vertically and horizontally
- Cost-performance optimization

Module 8: Security and Compliance

- Identity and Access Management (IAM)
- Encryption at rest and in transit
- Database authentication and authorization
- Auditing and compliance

- Securing sensitive data

Module 9: Monitoring and Troubleshooting

- Using Cloud Monitoring and Logging
- Setting alerts and dashboards
- Troubleshooting performance issues
- Debugging database failures

Module 10: Backup, Recovery, and Disaster Recovery

- Backup strategies across services
- Point-in-time recovery
- Disaster recovery planning
- Multi-region deployment strategies

Module 11: Automation and Infrastructure as Code

- Automating database deployment
- Using Terraform with GCP
- CI/CD integration for databases
- Scheduled operations and maintenance

Module 12: Data Integration and Analytics

- Integrating databases with BigQuery
- Data pipelines using Dataflow
- ETL/ELT concepts
- Real-time data processing

Module 13: Cost Management and Optimization

- Understanding pricing models
- Cost monitoring and budgeting
- Rightsizing resources

- Optimization strategies

Module 14: Best Practices and Design Patterns

- Database design patterns
- High availability architectures
- Multi-cloud and hybrid strategies
- Real-world use cases

Module 15: Certification Preparation and Case Studies

- Exam guide and preparation tips
- Sample questions and scenarios
- Real-world case studies
- Final review and Q&A