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# Upskill Program-2026

## PostgreSQL Database Administration Training Curriculum (15 Weeks)

Weeks	Date	Session Title	Topic	Mentor
Week 0	11th April, 2026	Kick-off session, Introduction & Installation	PostgreSQL overview, installation & basics	Hari/Venkata
Week 1	18th April, 2026	Re-Introducing PostgreSQL Architecture & Parameters	Deep dive into architecture and configuration parameters	Hari/Shashi
Week 2	25th April, 2026	DevOps Session-1	Introduction to DevOps for Postgres Engineers	Venkata/Hari
Week 3	2nd May, 2026	Database Design & Schema Management	Data types, schema design, and indexing	Bhavani A
Week 4	9th May, 2026	AI & PostgreSQL	Introduction to AI and Database. How Postgres is changing in the AI space	Sivasankar Prasad
Week 5	16th May, 2026	Performance Tuning & Optimization	Query optimization and advanced PostgreSQL tuning along with DBtune	Hari
Week 6	23rd May, 2026	Backup & Restore	Backup strategies and restore procedures	Abbas
Week 7	30th May, 2026	Table Partitioning & PG18 New Features in Action	Partitioning strategies + New features	Suresh/Shameer
<b>MID-PROGRAM ASSESSMENT</b>				
Week 8	6th June, 2026	Security	User management, access control, encryption	Hari
Week 9	13th June, 2026	Replication	Streaming replications & management	Akhil
Week 10	20th June, 2026	High Availability	Failover, switchover, and HA tools	Akhil
Week 11	27th June, 2026	Monitoring & Maintenance	Monitoring tools, VACUUM, and bloat management	Suresh



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Week 12	4th July, 2026	Extensions & Customization	Extensions and custom configurations	Rajesh/Shashikant
Week 13	11th July, 2026	Introduction to Database Migration	Migration considerations & tools	Tirumala
Week 14	18th July, 2026	DevOps Automation for PG DBAs	Advanced topics on DB tasks automation	Venkata/Hari
Week 15	25th July, 2026	Introduction to PG Internals	How to look at PG source code for learning/debugging	Dinesh Salve

## Upskill Program – 2026

### PostgreSQL Database Administration Training Curriculum (15 Weeks)

#### Week 0 – Training Pre-requisites & Kick-off Session

##### Logistics Setup

- Arrange for a laptop/desktop with webcam & stable internet connection
- Install Google Meet, VM software (for Windows users)
- Access to Linux OS (Rocky Linux / Ubuntu preferred)
- Basic knowledge of Linux commands

##### Introduction to PostgreSQL

- Overview of PostgreSQL
- History and key features
- Use cases and advantages

##### Installation & Setup

- Installing PostgreSQL on Linux/Windows
- Initial configuration
- Understanding directory structure

##### Basic SQL Commands



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- Introduction to SQL
- Basic commands (SELECT, INSERT, UPDATE, DELETE)
- Hands-on exercises

## **Week 1 – PostgreSQL Architecture & Parameters**

### **PostgreSQL Architecture**

- Architecture components
- Process model
- Memory management
- Storage management
- System catalog

### **Configuration & Parameters**

- Configuration files (postgresql.conf, pg\_hba.conf)
- Important parameters
- Parameter tuning basics
- Quiz – 15 minutes

## **Week 2 – DevOps Session 1**

### **Introduction to DevOps**

- What is DevOps?
- Importance for DBAs

### **Version Control**

- Introduction to Git
- Managing database scripts

### **CI/CD Basics**

- Continuous Integration & Deployment concepts
- Database deployment workflows

### **Automation Basics**



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- Scripting fundamentals
- Intro to automation tools

## **Week 3 – Database Design & Schema Management**

### **Data Types & Tables**

- PostgreSQL data types
- Creating and managing tables
- Constraints (Primary Key, Foreign Key, Unique, Check)

### **Indexing**

- Importance of indexing
- Types of indexes
- Index management

### **Schema Design**

- Normalization & denormalization
- Best practices
- Hands-on exercises

## **Week 4 – AI & PostgreSQL**

### **Introduction to AI**

- Basics of AI & ML
- Role of data in AI

### **PostgreSQL in AI**

- How PostgreSQL supports AI workloads
- Introduction to vector data & embeddings

### **Use Cases**

- Search systems
- Recommendation engines



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- Basic RAG concepts

## **Week 5 – Performance Tuning & Optimization**

### **Query Optimization**

- Understanding execution plans
- Using EXPLAIN & ANALYZE
- Query optimization techniques

### **Performance Tuning**

- PostgreSQL parameter tuning
- Resource management (CPU, memory, I/O)
- Connection pooling

### **Tools**

- Introduction to DBtune
- Hands-on lab
- Quiz – 15 minutes

## **Week 6 – Backup & Restore**

### **Backup Strategies**

- Importance of backups
- Logical vs Physical backups
- Tools (pg\_dump, pg\_basebackup)

### **Restore Procedures**

- Restoring logical backups
- Physical restore
- Point-in-time recovery (PITR)
- Hands-on lab



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## **Week 7 – Table Partitioning & PG18 Features**

### **Partitioning**

- Introduction to partitioning
- Types (Range, List, Hash)
- Use cases

### **Implementation**

- Creating partitioned tables
- Managing partitions

### **PostgreSQL 18 Features**

- Overview of new features
- Practical use cases
- Hands-on lab
- Quiz – 15 minutes

## **MID-PROGRAM ASSESSMENT**

## **Week 8 – Security**

### **User Management**

- Users & roles
- Authentication methods

### **Access Control**

- GRANT & REVOKE
- Row-level security (RLS)

### **Data Security**

- Encryption (at rest & in transit)
- SSL configuration
- Hands-on exercises



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- Quiz – 15 minutes

## **Week 9 – Replication**

### **Replication Basics**

- Introduction to replication
- Types of replication

### **Streaming Replication & Logical Replication**

- Setup and configuration
- Monitoring replication
- Hands-on lab
- Quiz – 15 minutes

## **Week 10 – High Availability**

### **High Availability Concepts**

- Importance of HA
- Failover & switchover

### **HA Tools**

- Patroni
- repmgr
- Hands-on lab
- Quiz – 15 minutes

## **Week 11 – Monitoring & Maintenance**

### **Monitoring**

- Monitoring tools
- pg\_stat\_statements



- pgBadger
- pg\_profile

## **Maintenance**

- VACUUM & ANALYZE
- Bloat management
- Routine DBA tasks
- Hands-on lab
- Quiz – 15 minutes

## **Week 12 – Extensions & Customization**

### **Extensions**

- Popular extensions (PostGIS, hstore, pg\_cron)
- Installation & usage

### **Customization**

- PostgreSQL configuration tuning
- Introduction to custom extensions
- Hands-on lab
- Quiz – 15 minutes

## **Week 13 – Database Migration**

### **Migration Overview**

- Why migrate to PostgreSQL
- Migration strategies

### **Migration Types**

- Homogeneous migration
- Heterogeneous migration

### **Tools & Techniques**



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- Migration tools overview
- Logical replication considerations

## **Week 14 – DevOps Automation for PG DBAs**

### **Automation**

- Automating database tasks
- Backup & monitoring automation

### **Advanced DevOps**

- CI/CD pipelines for databases
- Infrastructure as Code basics

## **Week 15 – PostgreSQL Internals**

### **Internals Overview**

- PostgreSQL source code basics
- Internal working of database

### **Debugging & Learning**

- How to read source code
- Debugging techniques

## **Final Session – AMI / Open Discussion**

- Open Q&A
- Doubt clarification
- Career guidance