Develop AI-enabled database solutions (DP-800) Training

Duration: **3 Day**

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Overview

Modern database professionals are expected to do far more than design relational databases. Today's data platforms must support intelligent applications, integrate with AI services, protect sensitive information, and deliver high performance across cloud and hybrid environments.

This course provides developers and data professionals with the practical skills required to build AI-enabled database applications using Microsoft SQL technologies. Participants will explore database development, advanced Transact-SQL programming, AI-assisted coding, security, DevOps, intelligent search, vector-based retrieval, and Generative AI integration.

Through practical labs and enterprise scenarios, learners will discover how to combine structured data with AI capabilities to create secure, scalable, and intelligent database solutions suitable for modern business applications.

Prerequisites

Participants should have experience with:

- SQL Server or Azure SQL Database
- Writing SQL queries
- Relational database concepts
- Basic database development
- Microsoft Azure fundamentals (recommended)

Previous experience with AI technologies is not required. Concepts such as vector search, embeddings, and Retrieval-Augmented Generation are introduced during the course.

Who Should Attend

This course is designed for professionals involved in designing, developing, or maintaining Microsoft SQL solutions, including:

- SQL Developers
- Database Administrators
- Data Engineers
- Application Developers
- BI and Analytics Professionals
- Cloud Database Engineers
- Solution Architects
- Technical teams modernising enterprise database platforms

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What You Will Learn

Upon successful completion, learners will be able to:

- Design scalable database schemas.
- Develop advanced SQL logic using Transact-SQL.
- Implement stored procedures, functions, triggers, and views.
- Secure databases using modern authentication and protection mechanisms.
- Monitor and tune database performance.
- Build CI/CD pipelines for database projects.
- Integrate SQL solutions with cloud services and APIs.
- Generate and manage vector embeddings.
- Implement semantic and hybrid search experiences.
- Design enterprise Retrieval-Augmented Generation (RAG) solutions.

Outline

Module 1 – Modern Database Design

Topics include:

- Microsoft SQL platform architecture
- Database modelling techniques
- Schema design
- Data integrity
- Index strategies
- JSON support
- Partitioning large datasets
- Designing scalable database structures

Practical Lab

- Build and optimise a relational database

Module 2 – Advanced SQL Development

Topics include:

- Views and reusable queries
- Stored procedures
- User-defined functions
- Triggers
- Common Table Expressions (CTEs)
- Window functions
- JSON processing
- Graph queries
- Error handling
- Advanced query optimisation

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Practical Lab

- Develop reusable database components

Module 3 – AI-Assisted Database Development

Topics include:

- AI-powered development workflows
- GitHub Copilot for SQL
- Microsoft Fabric AI capabilities
- Prompting for SQL development
- AI-assisted code generation
- Development governance
- Secure AI usage

Practical Lab

- Configure AI development tools
- Generate and review SQL code using AI

Module 4 – Database Security and Governance

Topics include:

- Encryption strategies
- Dynamic data masking
- Row-level security
- Permission management
- Auditing
- Compliance controls
- Protecting AI-enabled database services

Practical Lab

- Secure enterprise database environments

Module 5 – Performance Engineering

Topics include:

- Query optimisation
- Execution plan analysis
- Transaction management
- Concurrency control
- Query Store
- Performance diagnostics

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- Resolving blocking and deadlocks

Practical Lab

- Analyse and optimise production workloads

Module 6 – Database DevOps

Topics include:

- SQL Database Projects
- Source control integration
- Automated testing
- Continuous Integration
- Continuous Deployment
- Schema versioning
- Release management

Practical Lab

- Build an automated deployment pipeline

Module 7 – Intelligent Data Applications

Topics include:

- REST and GraphQL integration
- Azure service connectivity
- Vector embeddings
- Semantic search
- Hybrid search
- AI model integration
- Retrieval-Augmented Generation architecture

Practical Lab

- Build an AI-powered database application using vector search and enterprise knowledge

Practical Learning

Throughout the course, participants will complete hands-on exercises that include:

- Database modelling
- Advanced SQL programming
- AI-assisted development
- Security implementation
- Performance optimisation

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- DevOps automation
- Vector embedding generation
- Intelligent search implementation
- RAG application development
- End-to-end AI database solution delivery

Skills Gained

After completing this course, participants will be able to develop modern Microsoft SQL solutions that combine traditional database engineering with artificial intelligence capabilities. They will understand how to build secure, scalable, and high-performing database applications while incorporating semantic search, vector technologies, AI-assisted development, and enterprise-ready Generative AI solutions into real-world business systems.