



AGILE LEADERS
Training Center

23 - 27 Mar 2027
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المراجع: 103600692_83909 التاريخ: 23 - 27 Mar 2027 الموقع: روما الرسوم: Euro 5700

Course Overview:

PostgreSQL with AI: Vector Databases, RAG and Intelligent Applications is a practical PostgreSQL AI Training course for professionals building secure, data-grounded solutions. Participants progress from PostgreSQL fundamentals, administration, and AI-assisted SQL Training to PostgreSQL embeddings, pgvector Training, and vector similarity search. The course explains exact retrieval, HNSW and IVFFlat indexing, metadata filtering, and PostgreSQL Semantic Search before connecting these capabilities to language models. Participants then design Retrieval-Augmented Generation pipelines and complete PostgreSQL Chatbot Development exercises using governed enterprise data.

Grounded in PostgreSQL documentation, pgvector implementation guidance, RAG research, and recognized AI risk practices, this PostgreSQL AI Course balances development with PostgreSQL Performance Tuning and PostgreSQL Security Training. Participants finish prepared to design, evaluate, protect, and deploy reliable intelligent applications using PostgreSQL with AI in operational environments with measurable business value.

Target Audience:

- PostgreSQL database administrators
- Database developers and database engineers
- AI and machine learning engineers
- Backend and full-stack developers
- Data engineers and data architects
- Software and solutions architects
- DevOps and cloud engineers
- Application integration specialists
- Business intelligence developers
- Information security professionals
- Technical team leaders
- Professionals developing RAG systems and AI chatbots

Targeted Organizational Departments:

- Database administration and data management
- Artificial intelligence and machine learning
- Software and application development
- Data engineering and analytics
- Enterprise and solutions architecture
- Cloud infrastructure and DevOps
- Cybersecurity and information governance
- Digital transformation and innovation
- Business intelligence and reporting
- Knowledge management

Targeted Industries:

- Banking, financial services, and insurance
- Government and public-sector organizations
- Telecommunications
- Healthcare and life sciences
- Technology and software development
- Energy, utilities, and infrastructure
- Retail and e-commerce
- Education and scientific research
- Legal and professional services
- Manufacturing and logistics
- Media and digital publishing

Course Offerings:

By the end of this course, participants will be able to:

- Configure and administer PostgreSQL for AI-enabled applications
- Apply AI-assisted SQL techniques while validating generated queries
- Install and configure the pgvector extension
- Generate and store PostgreSQL embeddings with relational data
- Use cosine, Euclidean, inner-product, and other distance measures
- Build exact and approximate vector similarity search queries
- Configure HNSW and IVFFlat indexes
- Combine vector search with metadata filters and relational queries
- Implement PostgreSQL Semantic Search
- Connect PostgreSQL to OpenAI and other language models

Training Methodology:

Training combines instructor-led explanations, demonstrations, laboratories, case studies, group design work, troubleshooting exercises, and feedback. Participants first practise PostgreSQL administration and AI-assisted SQL

Training, checking generated queries for correctness, efficiency, and unsafe behaviour. Progressive pgvector Training laboratories cover embedding storage, distance operators, exact search, HNSW, IVFFlat, metadata filters, and query-plan analysis. Teams then map document ingestion, chunking, PostgreSQL embeddings, retrieval, augmentation, generation, and citation flows for a realistic PostgreSQL RAG Training scenario. Security exercises examine prompt injection, sensitive-information disclosure, poisoned vector content, excessive permissions, and insecure model outputs. Performance experiments compare recall, latency, storage, and index settings. Throughout the course, participants receive observable results and instructor feedback. The final activity integrates database design, semantic retrieval, chatbot logic, risk controls, evaluation criteria, monitoring, and deployment into one production-oriented intelligent application design.

Course Toolbox:

- PostgreSQL AI application architecture examples •
- Database and vector-schema examples •
- AI-assisted SQL prompt examples •
- pgvector installation and configuration guidance •
- Embedding-generation workflow examples •
- Vector-distance operator reference •
- HNSW and IVFFlat configuration examples •
- Document ingestion and chunking checklist •
- Semantic search design worksheet •
- RAG pipeline architecture template •

The course provides insights, demonstrations, templates, and examples of relevant tools. PostgreSQL environments, AI subscriptions, API credits, cloud services, software licences, hardware, and third-party tools provided. NOT are

Course Agenda:

Day 1: PostgreSQL Foundations and AI-Assisted SQL

- PostgreSQL architecture, databases, schemas, tables, and data types Topic 1: •
- PostgreSQL installation, configuration, and server administration Topic 2: •
- Tables, relationships, constraints, transactions, and conventional indexes Topic 3: •
- SQL development for structured application data Topic 4: •
- AI-assisted SQL generation, explanation, and optimization Topic 5: •
- Validating AI-generated queries for accuracy, security, and performance Topic 6: •
- Reviewing PostgreSQL fundamentals and correcting an AI-generated query Reflection & Review: •

Day 2: PostgreSQL Embeddings and Vector Search

- Vector embeddings and semantic representation Topic 1: •
- PostgreSQL as a relational and vector database Topic 2: •
- Installing and configuring the pgvector extension Topic 3: •
- Creating vector columns and storing PostgreSQL embeddings Topic 4: •
- Cosine, Euclidean, inner-product, L1, Hamming, and Jaccard distances Topic 5: •
- Building vector similarity search queries with metadata filters Topic 6: •
- Comparing keyword, full-text, and PostgreSQL Semantic Search results Reflection & Review: •

Day 3: Vector Indexing and RAG Development

- Exact and approximate nearest-neighbour search Topic 1: •
- HNSW architecture, construction, search, and tuning parameters Topic 2: •
- IVFFlat lists, probes, recall, and query-performance trade-offs Topic 3: •
- Document extraction, cleaning, segmentation, and chunking Topic 4: •
- Embedding pipelines and PostgreSQL vector indexing Topic 5: •
- Retrieval, augmentation, generation, and source grounding Topic 6: •
- Designing a PostgreSQL RAG pipeline for enterprise documents Reflection & Review: •

Day 4: PostgreSQL Chatbots and Secure AI Integration

- Connecting PostgreSQL to OpenAI and other language models Topic 1: •
- Prompt construction using retrieved database context Topic 2: •
- Developing conversational retrieval and database-aware chatbots Topic 3: •
- Managing conversation history, citations, and source attribution Topic 4: •
- Controlling roles, privileges, row access, credentials, and sensitive data Topic 5: •
- Preventing prompt injection, poisoned embeddings, unauthorized retrieval, and data leakage Topic 6: •
- Reviewing and strengthening a PostgreSQL chatbot security architecture Reflection & Review: •

Day 5: Performance, Evaluation and Deployment

- Measuring retrieval relevance, recall, precision, latency, and groundedness Topic 1: •
- Using EXPLAIN and execution plans for vector-query analysis Topic 2: •
- Tuning memory, connections, storage, queries, and vector indexes Topic 3: •
- Monitoring, logging, backup, recovery, and lifecycle management Topic 4: •
- Deploying PostgreSQL AI applications on-premises and in the cloud Topic 5: •
- Designing an end-to-end intelligent application with PostgreSQL Topic 6: •
- Presenting and reviewing a secure, production-ready RAG application design Reflection & Review: •

FAQ:

What specific qualifications or prerequisites are needed for participants before enrolling in the course?

Participants should understand basic database concepts and have introductory SQL knowledge. Previous experience with PostgreSQL, Python, APIs, cloud platforms, or AI applications is helpful but not mandatory. The technical exercises can be adjusted to participants' development and database experience.

How long is each day's session, and is there a total number of hours required for the entire course?

Each day's session is generally structured to last around 4-5 hours, with breaks and interactive activities included. The total course duration spans five days, approximately 20-25 hours of instruction.

Does PostgreSQL replace the need for a dedicated vector database?

PostgreSQL can store, index, filter, and search embeddings through pgvector while retaining SQL, transactions, joins, metadata, access controls, backup, and replication capabilities. This makes it suitable for many semantic search and RAG applications. A separate vector database may still be considered when an application has exceptional distribution, scale, latency, or specialized operational requirements.

How This Course is Different from Other PostgreSQL AI Training Courses:

Unlike a general Vector Database Course or isolated chatbot workshop, this programme treats PostgreSQL as the -operational foundation of the complete AI application lifecycle. It connects relational modelling, administration, AI assisted SQL Training, PostgreSQL embeddings, pgvector indexing, semantic retrieval, RAG orchestration, security, performance, and deployment in one coherent learning journey. Participants compare exact search with HNSW and IVFFlat, examine recall-and-latency trade-offs, and combine vector similarity search with metadata filters and PostgreSQL access controls. The PostgreSQL RAG Training component goes beyond a simple demonstration by addressing ingestion quality, chunking, grounding, citations, retrieval evaluation, prompt injection, sensitive-information exposure, and vector or embedding weaknesses. It also draws on PostgreSQL documentation, foundational RAG research, OWASP guidance, and the NIST Generative AI risk profile. Consequently, participants learn not only how to build an intelligent application, but how to test, govern, tune, monitor, and deploy it responsibly in an enterprise environment under realistic operational and governance constraints.

فئات الدورات التدريبية

الدورات التدريبية في مجال البيئة والاستدامة	دورات إدارة الجودة وتطوير العمليات
دورات إدارة و تحليل البيانات ودورات علم البيانات	دورات إدارة و تطوير الموارد البشرية
دورات الذهن السيرياني ودورات تقنية المعلومات	دورات الاتصال الجماهيري و السياسات والعلاقات العامة
دورات التدريب القانوني والهشتريات والتعاقدات	دورات التسويق وإدارة علاقات العملاء وإدارة المبيعات
دورات الحوكمة وإدارة المخاطر والامتثال	دورات السكرتارية و إدارة المكاتب
دورات الصحة والسلامة والذهن المهني	دورات الصيانة ودورات المجالات الهندسية المتنوعة
دورات المحاسبة و التهويل و دورات الإدارة المالية	دورات المهارات الشخصية وتطوير الذات
دورات في مجالات القيادة والإدارة	دورات معتمدة من قبل هيئات دولية
دورات مكتب إدارة المشاريع وإدارة المشاريع الرشيقية	



معدن التدريب

أكرا غانا	أثينا اليونان	أبوظبي الإمارات العربية المتحدة
الجبيل المملكة العربية السعودية	استنبول تركيا	أهستردام هولندا
الرياض المملكة العربية السعودية	الدوحة قطر	الدار البيضاء المغرب
المنامة مملكة البحرين	الكويت الكويت	القاهرة مصر
بانكوك تايلند	باكو أذربيجان	باريس فرنسا
برلين ألمانيا	برشلونة إسبانيا	براغ جمهورية التشيك
تيليسي جورجيا	بوكيت تايلاند	بورتو البرتغال
جنيف سويسرا	جاكارتا جمهورية إندونيسيا	تورنتو كندا
روما إيطاليا	حلي الإمارات العربية المتحدة	جوهانسبرغ جنوب أفريقيا
سنغافورة سنغافورة	سان دييغو الولايات المتحدة الأمريكية	زنجان تنزانيا
شيكاغو الولايات المتحدة الأمريكية	شرم الشيخ مصر	سيول كوريا الجنوبية
طوكيو اليابان	طشقند أوزبكستان	طرابزون تركيا
فرانكفورت ألمانيا	عن بعد منصة زووم	عمان المملكة الأردنية الهاشمية

مدن التدريب

كيب تاون جنوب افريقيا	كوالالمبور ماليزيا	فيينا النمسا
لندن المملكة المتحدة	لشبونة البرتغال	لانكاوي ماليزيا
مسقط سلطنة عمان	هدريد اسبانيا	ماربيا اسبانيا
ميونخ ألمانيا	ميلان إيطاليا	مونترو سويسرا
	نيويورك الولايات المتحدة الأمريكية	نيروبي كينيا