

FDE Academy: consultant tech-stack curriculum

What every Forward Deployed Engineer must master on Microsoft Azure and Google Cloud

Design principle: an FDE is ~50% engineer, ~30% data person, ~20% consultant. The curriculum is built in four layers: cloud-agnostic foundations, Azure track, GCP track, and FDE soft skills and industry knowledge. Every consultant completes Foundations plus at least one cloud track; leads complete both.

Layer 1: Cloud-agnostic foundations (all consultants)

Area	Topics	Tools
Programming	Python (async, typing, packaging), SQL (advanced, window functions), REST APIs, Git	Python, FastAPI, pytest, Git
Data engineering	Dimensional modeling, ELT, data quality, CDC, lakehouse concepts, Delta / Iceberg	dbt, Spark, Airflow
LLM fundamentals	Tokens, context windows, prompting, structured output, function / tool calling, cost and latency	OpenAI / Gemini / Claude APIs
RAG	Chunking, embeddings, hybrid search, reranking, citations, document parsing	LlamaIndex, LangChain, vector DBs
Agents	Tool use, planning (ReAct), multi-agent orchestration, memory and state, human-in-the-loop, MCP servers	LangGraph, CrewAI, MCP
Evaluation & LLMops	Golden datasets, LLM-as-judge, groundedness and hallucination metrics, tracing, prompt versioning, CI for prompts	Ragas, DeepEval, Langfuse, MLflow
Classical ML	Classification, forecasting, anomaly detection; when not to use an LLM	scikit-learn, XGBoost
Security & compliance	Prompt injection, data leakage, PII masking, KVKK/GDPR, model risk management, audit logging	OWASP LLM Top 10
DevOps	Docker, CI/CD, infrastructure as code, secrets management	Docker, GitHub Actions, Terraform

Layer 2: Microsoft Azure track

Area	Services to master
Platform & identity	Azure landing zone, resource groups, Entra ID, managed identities, Key Vault, private endpoints, VNets
Data	Microsoft Fabric (OneLake, Data Factory, Lakehouse, Warehouse), Azure Databricks, Azure SQL, Cosmos DB, Event Hubs
Governance	Microsoft Purview (catalog, lineage, sensitivity labels)
Generative AI	Azure OpenAI Service, Microsoft Foundry (model catalog, prompt flow, evaluations, tracing), Foundry Agent Service
Retrieval	Azure AI Search (vector + hybrid + semantic ranker, indexers, skillsets)

Area	Services to master
Agent frameworks	Microsoft Agent Framework / Semantic Kernel, AutoGen concepts, Copilot Studio for low-code agents
Cognitive services	Document Intelligence, AI Speech, AI Language, Translator, Content Safety
Apps & integration	Container Apps, App Service, Functions, Logic Apps, API Management (AI gateway, token limits)
Ops	Azure Monitor, Application Insights, Azure DevOps / GitHub Actions, Bicep or Terraform, cost management
BI & M365	Power BI (semantic models, Copilot in Power BI), Microsoft 365 Copilot extensibility, Teams bots
Certifications	AZ-900 → AI-900 → AI-102 (Azure AI Engineer) and DP-700 (Fabric Data Engineer); leads add AZ-305 (Solutions Architect)

Layer 3: Google Cloud track

Area	Services to master
Platform & identity	Resource hierarchy, IAM, service accounts, VPC, VPC Service Controls, Secret Manager, CMEK
Data	BigQuery (incl. BigQuery ML, vector search, Gemini in BigQuery), Cloud Storage, Dataflow, Dataproc, Pub/Sub, Datastream, Cloud Composer
Governance	Dataplex (catalog, data quality, lineage), Sensitive Data Protection (DLP)
Generative AI	Vertex AI, Gemini models, Model Garden, Vertex AI Studio, grounding, context caching, tuning
Retrieval	Vertex AI Search, Vertex AI RAG Engine, Vector Search, AlloyDB AI
Agent frameworks	Agent Development Kit (ADK), Vertex AI Agent Engine, Agent2Agent (A2A) protocol, Gemini Enterprise agents
Cognitive services	Document AI, Speech-to-Text / Text-to-Speech, Contact Center AI (CCAI), Translation
Apps & integration	Cloud Run, Cloud Functions, Apigee, Application Integration, Workflows
Ops	Cloud Logging and Monitoring, Cloud Trace, Cloud Build, Terraform, Vertex AI Gen AI evaluation, Model Armor
BI	Looker (semantic layer / LookML), Looker Studio, conversational analytics
Certifications	Cloud Digital Leader → Generative AI Leader → Professional Machine Learning Engineer and Professional Data Engineer; leads add Professional Cloud Architect

Service and certification names change frequently; verify current names in Microsoft Learn and Google Cloud Skills Boost before enrolling.

Layer 4: FDE consulting skills & industry knowledge

Skill	What it looks like in practice
Discovery & scoping	Run stakeholder interviews, shadow end users, map the process, find where the value and data really are
Business case	Translate a use case into KPIs, baseline, ROI and run cost (token economics)
Demo-driven delivery	Weekly demos to end users, fast iteration, managing scope vs speed vs quality
Change & adoption	Training users, champions, handling expert resistance, adoption metrics
Communication	Explain technical trade-offs to executives; write clear specs for AI coding agents

Skill	What it looks like in practice
Telco domain	BSS/OSS, CDRs, network KPIs, churn and ARPU, TM Forum basics
Banking domain	Core banking, credit lifecycle, KYC/AML, BDDK expectations, model risk
Insurance domain	Policy and claims lifecycle, underwriting, provisions, actuarial basics, SEDDK, health tariff rules
E-commerce domain	Catalogue, search, OMS, returns, marketplace operations, CX metrics

Suggested 12-week onboarding path

Weeks	Focus	Capstone
1-2	Foundations: Python, SQL, LLM APIs, prompting, Git, Docker	Build a tool-calling chatbot
3-4	RAG and data engineering on chosen cloud	RAG over a policy/document corpus with citations
5-6	Agents, MCP and Text2SQL over a warehouse	Agent that answers questions on a sample datamart
7-8	Evaluation, guardrails, security, LLMOps	Eval suite + red-team report for the week 5-6 agent
9-10	Second cloud track (leads) or deepening (engineers)	Port the capstone to the other cloud
11-12	Industry module + consulting skills, shadow a live engagement	Client-style demo and business case pitch

Consultant levels

Level	Expectation
Associate FDE	Foundations + 1 cloud track, 1 associate certification, delivers components under guidance
FDE	Owens a use case end to end, 1 professional certification, runs demos with clients
Senior / Lead FDE	Both clouds, leads discovery and squads, owns client outcomes and business case
Principal FDE	Shapes offerings and reusable accelerators, industry thought leadership