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10,0000+
Students Trained

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GEN-AI

DEVELOPER

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COURSE CURRICULUM

Gen AI Developer Program

COURSE DURATION 3MONTHS	SESSION HOURS 200HRS	CASE STUDIES & PROJECTS

Who Is This Program For?

➪ Software & Backend Engineers

▶ Test Automation Engineers ▶ Data ▶ Cloud / Solution / Enterprise Architects

➪ DevOps & Platform Engineers

➪ Technical Leads transitioning into AI

➪ Professionals serious about Generative AI as a long-term career

Who Is This Program For?

➪ We start from first principles and build up to expert-level system design.

Why This Program Is Different (Critical)

Typical GenAI Courses	This Program
Prompt tricks	System engineering
Typical GenAI Courses	This Program
Chatbots	Enterprise platforms
No evaluation	Evaluation-driven development (EDD)
Toy agents	Controlled Agentic AI (LangGraph)
No governance	Security, HITL & compliance
Vendor-locked	Cloud-agnostic + MCP

Who Program Philosophy (How Real AI Is Built)Is This Program For?

Modern GenAI systems fail not because of models —
they fail because of poor architecture, lack of evaluation, no cost control, and no governance.

This program trains you to

- ➪ Think in systems, not prompts
- ➪ Design for failure and recovery
- ➪ Prove AI quality using metrics
- ➪ Control cost, risk, and scale
- ➪ Communicate clearly in system design interviews

Terminology & Mental Model Bootcamp (Naive Onboarding)

- ➪ Before building anything, everyone aligns on language
- ➪ Generative AI vs ML vs Rule-based systems
- ➪ Large Language Models (LLMs): what they are & what they are NOT
- ➪ Tokens, context windows, latency, cost
- ➪ Prompts, hallucinations, grounding
- ➪ RAG (Retrieval-Augmented Generation)
- ➪ Agentic AI (LLM + tools + memory + control loop)
- ➪ HITL (Human-in-the-Loop)
- ➪ MCP (Model Context Protocol)
- ➪ Evaluation, guardrails, LLMOps

This removes fear for beginners and ambiguity for architects

Core Curriculum (Enterprise-Grade)

Core Curriculum (Enterprise-Grade)

- ➪ How LLMs reason (probabilistic, not deterministic)
- ➪ Where GenAI should and should NOT be used
- ➪ LLMs as stateless reasoning engines
- ➪ Separation of concerns: reasoning, data, execution, control

LLM Application Engineering

- Prompt engineering as software engineering
- Prompt templates & versioning
- Structured outputs (JSON, schemas)
- Tool / function calling
- Retry, fallback, and safety patterns

Retrieval-Augmented Generation (RAG)

- Why RAG beats fine-tuning in most enterprises
- Embeddings & similarity search
- Chunking strategies (fixed, semantic, layout-aware)
- Vector databases & metadata filtering
- Hybrid search & reranking
- Citations, grounding, freshness control
- Multi-tenant RAG design

Multimodal AI (Text + Images + Tables)

- Chat with PDFs, images, diagrams
- OCR limitations
- Table reasoning
- Evidence-backed answers

Agentic AI (Core Differentiator)

Agentic AI = LLM + tools + memory + control

- Tool-driven agents
- Planner–executor patterns
- Multi-agent systems
- Explicit failure modes:
  - Infinite loops
  - Tool hallucination
  - Cost explosions
  - Context poisoning

LangGraph (Production-Grade Agent Framework)

- ➪ Why LangGraph (determinism, safety)
- ➪ Nodes, edges, state
- ➪ Conditional routing
- ➪ Interrupt & resume
- ➪ Human approval checkpoints
- ➪ Supervisor–worker agents

Memory in AI Systems

- ➪ Short-term vs long-term memory
- ➪ Episodic vs semantic memory
- ➪ Retrieval strategies
- ➪ Privacy & eviction policies

Human-in-the-Loop (HITL)

- ➪ Why enterprises require HITL
- ➪ Approval, review, escalation
- ➪ Audit trails
- ➪ Feedback ingestion
- ➪ LangGraph-based HITL workflows

Model Context Protocol (MCP)

- ➪ Why MCP exists
- ➪ MCP vs REST vs plugins
- ➪ Tools, resources, prompts
- ➪ Sessions & transports
- ➪ Enterprise MCP gateways
- ➪ Governance & security boundaries

What MOST Courses Miss (We Don't)

Evaluation & Benchmarking (EDD)

How do you know your AI system works?”

- ➩ Ground truth creation
- ➩ Offline & online evaluation
- ➩ Precision@k / Recall@k
- ➩ Faithfulness & relevance
- ➩ Human scoring rubrics
- ➩ Regression detection
- ➩ Cost vs quality curves

Failure Engineering & Guardrails

What happens when AI fails?”

- ➩ Agent runaway detection
- ➩ Circuit breakers & kill switches
- ➩ Budget guards
- ➩ Safe degradation (AI   rules)
- ➩ Timeout & partial failure handling

Data Engineering for GenAI

- ➩ Document ingestion pipelines
- ➩ Incremental re-indexing
- ➩ Change data capture (CDC)
- ➩ Corpus versioning
- ➩ Data lineage for AI

AI Cost Engineering

- ➩ Token budgeting
- ➩ Model tier routing
- ➩ Cached responses
- ➩ Retrieval vs generation trade-offs
- ➩ Preventing cost explosions

Enterprise AI Platform Architecture

- ➪ AI gateways
- ➪ Prompt registries
- ➪ Evaluation services
- ➪ MCP governance
- ➪ Observability & cost control
- ➪ Internal AI marketplaces

LLMOps / Cloud-Native Deployment

- ➪ Prompt & model lifecycle management
- ➪ Observability (latency, cost, drift)
- ➪ CI/CD for AI systems
- ➪ Docker & Kubernetes patterns
- ➪ AWS / Azure / GCP architectures
- ➪ Security & secrets management

Security, Privacy & Responsible AI

- ➪ Prompt injection threats
- ➪ Tool abuse
- ➪ Data exfiltration risks
- ➪ Compliance (GDPR, audits)
- ➪ Explainability & transparency

GenAI System Design Interview Readiness

You will practice:

- ➪ Designing enterprise RAG systems
- ➪ Designing safe autonomous agents
- ➪ Designing MCP-based platforms
- ➪ Explaining trade-offs under pressure
- ➪ Handling failure & cost questions

Capstone Projects (Mandatory)

Developer Capstones

➪ RAG-based knowledge copilot
➪ LangGraph agent automation
➪ MCP server ecosystem

Architect Capstones

➪ Enterprise AI platform design
➪ Governance & cost model
➪ Migration strategy (non-AI AI)

Joint Capstone

➪ Architects design
➪ Developers implement
(simulates real organizations)

Career Outcomes

Graduates are ready for global roles:
➪ Generative AI Engineer
➪ LLM Engineer
➪ Agent Engineer
➪ AI Platform Engineer
➪ AI Architect

You graduate with:
➪ A portfolio
➪ System design confidence
➪ Interview-ready explanations
➪ Enterprise credibility

Final Takeaway

It teaches you: ▶ How real GenAI systems are built ▶ How they fail ▶ How they are evaluated ▶ How they are governed ▶ How they are scaled globally

Python Foundations

1.Python Basics

➪ Data types (strings, lists, tuples, dicts), control flow, functions
➪ OOP concepts (optional overview)

2.Environment Setup

➪ Virtual environments (venv, conda)
➪ Basic Git & GitHub for version control

3. Data Handling

➪ File I/O (CSV, JSON)
➪ Simple reading/writing with Pandas

Hands-On Lab

➪ Lab 1: Build a Python script to parse a CSV and produce basic summary stats.
➪ Push code to GitHub.

Outcome: Students establish a solid Python base, environment management, and Git.

Python Data Structures & ML Basics

1. Advanced Python Data Structures

➪ List/dict comprehensions, sets, decorators (optional)

FastAPI Essentials

1. FastAPI Introduction

➪ RESTful API concept, asynchronous I/O
➪ Core features (routers, Pydantic models)

2.Basic CRUD

➪ Handling GET/POST/PUT/DELETE
➪ Path & query parameters

3. API Security

➪ Oauth2 basics, JWT tokens (high-level overview)

Hands-On Lab

➪ **Lab 3:** Create a basic FastAPI app with CRUD endpoints for a mock resource (e.g., “employees”).
➪ Test endpoints using Postman or curl.

Outcome: Ability to scaffold a REST API in Python using FastAPI.

FastAPI Deep Dive & Unit Testing

1. Pydantic Models & Validation

➪ Request/response schemas, data validation

2. Unit Testing

➪ Pytest basics, mocking & fixtures
➪ Testing FastAPI endpoints

3. Deployment Packaging

➪ Requirements.txt or Pipfile
➪ Dockerfile basics (intro only)

Hands-On Lab

➪ **Lab 4:** Extend the Fast API app with validated data models and write pytest unit tests.
➪ Optionally create a Docker file for local container testing.
Outcome: Students can build a tested, container-ready API with validated schemas

Deploying Python APIs on AWS

1.AWS Overview

➪ **Key services:** AWS ECS, AWS Elastic Beanstalk, AWS Lambda + API Gateway
➪ IAM basics (roles, policies)

2. Docker & AWS Deployment

➪ Building Docker images
➪ Pushing to AWS ECR (Elastic Container Registry)
➪ Running containers on ECS or Elastic Beanstalk

3. Serverless (Optional)

➪ Brief mention of AWS Lambda

Hands-On Lab

➪ **Lab 5:** Containerize the FastAPI application and deploy to AWS ECS.
➪ Validate endpoints via public URL.
Outcome: Real-world exposure to container-based deployment on AWS.

Deploying Python APIs on Azure

1. Azure Basics

➪ Resource groups, Azure Container Registry (ACR)
➪ Azure Web App for Containers or Azure Container Instances (ACI)

2.Deployment Pipeline

➪ Docker image push/pull from ACR
➪ Setting environment variables & app settings

3. Monitoring & Logging

➪ Azure Monitor, App Insights for logs and metrics

Hands-On Lab

➪ **Lab 6:** Deploy the same Dockerized FastAPI app to Azure Web App for Containers.
➪ Review logs and basic metrics in Azure portal.
Outcome: Students learn how to replicate a container deployment process on Azure.

Deploying Python APIs on GCP

1. GCP Overview

➪ Services: Cloud Run, GKE, App Engine

2. Cloud Run Deployment

➪ Containerizing (Docker)
➪ Submitting images to Google Container Registry
➪ Configuring environment variables and concurrency

3. CI/CD

➪ GitHub Actions or GCP Cloud Build integration

Hands-On Lab

➪ **Lab 7:** Deploy the same FastAPI container to GCP Cloud Run.
➪ Validate auto-scaling behavior by sending multiple requests.
➪ **Outcome:** Students see how to deploy container-based Python services on GCP.

Deploying the ML Model on AWS, Azure & GCP

1. Model Serving Approaches

➪ Containerizing an ML model + FastAPI into one container

➪ Dealing with environment & memory constraints (esp. for large models)

2. Cloud-Specific Details

➪ AWS: ECS or SageMaker (intro only)

➪ Azure: Web App for Containers + model storage

➪ GCP: Cloud Run or Vertex AI (intro only)

Hands-On Lab

➪ **Lab 9:** Deploy the ML + FastAPI container to each cloud (or pick your favorite).

➪ Validate that your inference endpoint is accessible, stable, and logs performance metrics.

Outcome: Students learn to host a simple ML model on AWS, Azure, and GCP, reinforcing multi-cloud concepts with a working example.

Summary of Curriculum

➪ **Python & FastAPI:** Students learn Python basics and build robust REST APIs.

➪ **Testing & Containerization:** Master unit testing (pytest) and Docker packaging.

➪ **Cloud Deployments:** Deploy the same containerized application to AWS, Azure, and GCP.

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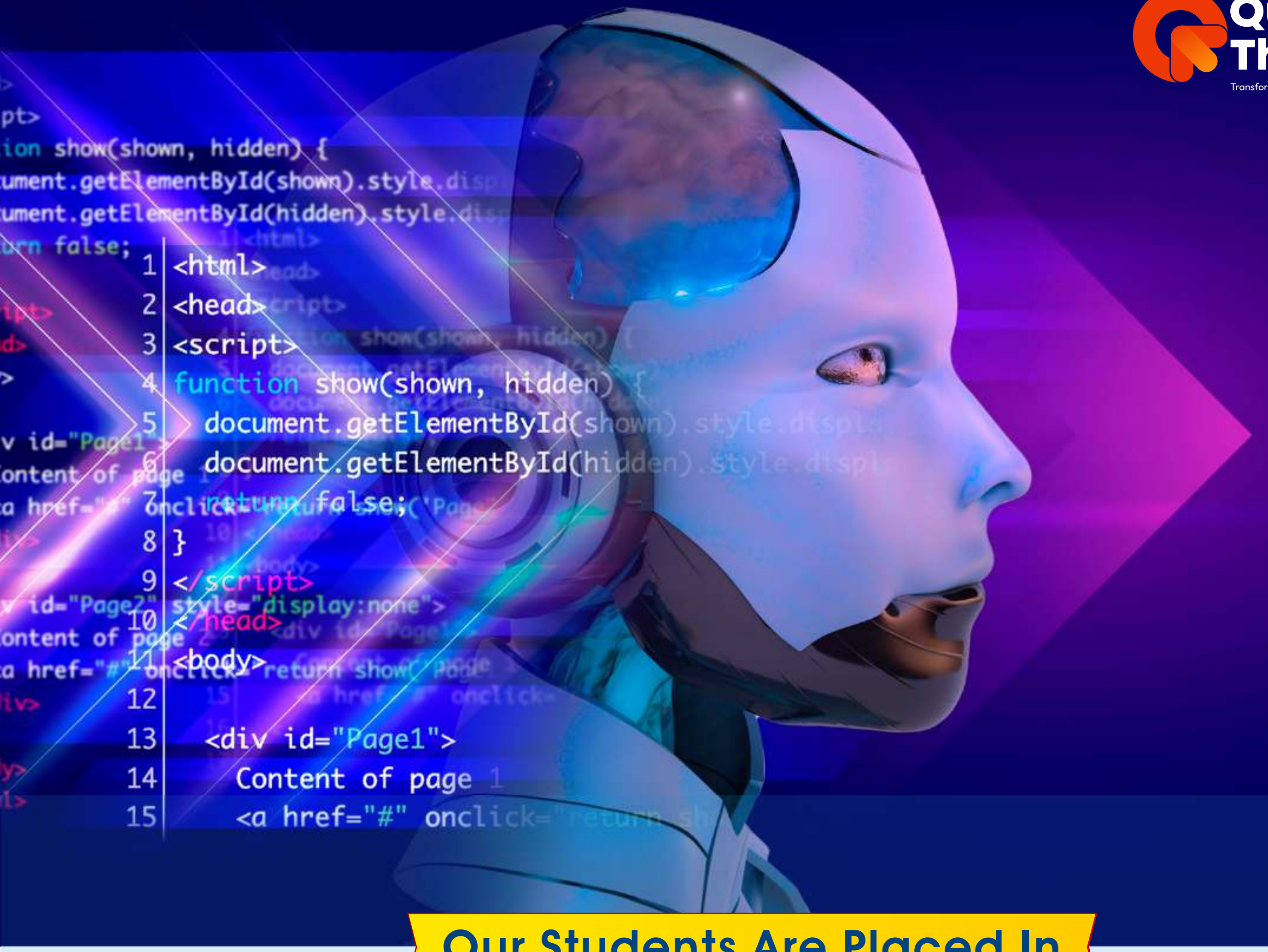

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<html>
<head>
<script>
function show(shown, hidden) {
  document.getElementById(shown).style.displ
  document.getElementById(hidden).style.displ
  return false;
}
</script>
</head>
<body>

  <div id="Page1">
    Content of page 1
    <a href="#" onclick="return sh
```

Our Students Are Placed In

tcs TATA CONSULTANCY SERVICES	Capgemini	LTIMindtree	accenture	66degrees	AFFINE	High Noon Consulting Possible is Everything
AGILISIUM BIG ON CLOUD. BIG ON DATA.	ALTIMETRIK	brillio	CGI	cisco	Cloud4C TIER 4 CLOUD	amazon
CLOUD9	CloudCover	Coforge	Cognizant	Convergytics	CSS CORP	Medtronic
databricks	dataflex	DXC TECHNOLOGY	Deloitte.	EMIDS	Foray	STIC Soft When you need the results
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JRD SYSTEMS	ValueLabs	archents	magnasoft	Innominds Powering the Digital Next	techforce.ai	techolution
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