

GraphQL Course

Course Duration: 40 Hours

Course Code: GQL101

1. Course Overview

The **GraphQL Course** is designed to help developers master GraphQL, a powerful query language for APIs and runtime for executing queries against data. This course covers GraphQL fundamentals, schema design, queries, mutations, subscriptions, and integrating GraphQL with frontend and backend technologies. Learners will gain hands-on experience building scalable APIs and connecting them with modern frontend frameworks like React, Angular, and Vue.

2. What You'll Learn?

- Core concepts of **GraphQL and its architecture**
- **Setting up GraphQL server** with Node.js and Apollo Server
- Writing **queries, mutations, and subscriptions**
- Designing **GraphQL schemas and resolvers**
- **Integrating GraphQL with REST APIs and databases**
- Connecting GraphQL to **frontend frameworks** (React, Angular, Vue)
- Error handling and authentication in GraphQL
- **Performance optimization and caching strategies**
- GraphQL **best practices and deployment**

3. Target Audience

- Web and backend developers interested in modern API development
- Full-stack developers wanting to integrate GraphQL with apps
- Professionals familiar with REST APIs who want to upgrade to GraphQL
- Beginners with basic JavaScript/Node.js knowledge

4. Pre-Requisites

- Basic knowledge of **JavaScript and Node.js**
- Familiarity with **APIs (REST/HTTP)**
- Understanding of **frontend frameworks** (React/Angular/Vue) is helpful but not mandatory

5. Course Content

Module 1: Introduction to GraphQL

- What is GraphQL?
- GraphQL vs REST APIs
- GraphQL architecture and workflow

Module 2: Setting Up GraphQL

- Installing Apollo Server with Node.js
- GraphQL schema basics
- Writing the first GraphQL query

Module 3: Queries and Mutations

- Defining and executing queries
- Writing mutations for data updates

- Handling variables and arguments

Module 4: GraphQL Schemas and Resolvers

- Defining types, fields, and resolvers
- Nested queries and relationships
- Schema stitching and modularization

Module 5: Subscriptions and Real-Time Data

- Introduction to subscriptions
- Setting up WebSockets for GraphQL
- Real-time communication use cases

Module 6: GraphQL with Databases

- Connecting GraphQL to MongoDB / SQL
- CRUD operations with GraphQL
- Data fetching strategies

Module 7: Integrating GraphQL with Frontend

- GraphQL with React (Apollo Client)
- GraphQL with Angular / Vue
- State management with GraphQL

Module 8: Security and Authentication

- Error handling in GraphQL
- Securing GraphQL APIs
- Authentication and authorization strategies

Module 9: Advanced GraphQL Concepts

- Caching and performance optimization
- Federation and distributed GraphQL
- GraphQL tooling (Playground, Voyager, GraphiQL)

Module 10: Deployment and Best Practices

- Building and deploying a GraphQL API
- Monitoring GraphQL services
- Best practices for scalable GraphQL applications

