



## Course Content

### Course Description:

This course is designed to provide participants with a deep understanding of the GraphQL query language, its core concepts, and practical implementation techniques. Through a combination of theoretical explanations, hands-on labs, and real-world examples, participants will gain the knowledge and skills needed to effectively design, build, and consume GraphQL APIs.

### Course Objectives:

Upon successful completion of this course, students will be able to:

- Understand the fundamentals of GraphQL as a query language for APIs and a runtime for fulfilling queries.
- Explore the tools and libraries available for working with GraphQL on the server-side and client-side, including Apollo Server, Apollo Client, AWS Amplify, and Relay.
- Understand the concepts of mutations and how to handle data modification operations in GraphQL.
- Apply best practices for schema design, versioning, performance optimization, and security considerations in GraphQL implementations.
- And much more!

### Prerequisites:

Prior programming experience (required)

JavaScript (recommended)

Node.js (recommended)

### Topics:

#### Lesson 1: Introduction to GraphQL

- What is GraphQL?
- GraphQL as a query language for APIs
- GraphQL as a runtime for fulfilling queries

#### Lesson 2: How Does GraphQL Work?

- Query structure and syntax
- Data shape matching
- Example query and response

#### Lesson 3: Implementing GraphQL with Various Programming Languages

- JavaScript and Node.js
- Go
- PHP
- Java
- Other supported languages



## Lesson 4: Tools and Libraries for GraphQL

- Apollo Server
- Apollo Client
- AWS Amplify
- Relay

### Lab 1: Getting Started with Apollo Server

- Setting up Apollo Server
- Creating a basic GraphQL schema
- Writing resolvers for data fetching

## Lesson 5: Exploring GraphQL Schemas

- Understanding object types, query types, and mutation types
- Anatomy of a type
- Basic data types and list types

## Lesson 6: Query and Mutation Types

- Defining entry points to the schema
- Passing arguments to queries and mutations

### Lab 2: Using Apollo Studio

- Exploring Apollo Client
- Integrating Apollo Dev Tools for debugging and monitoring
- Utilizing Apollo Studio Explorer for schema design and testing

### Lab 3: Creating a Client

- Setting up a client-side application

## Lesson 7: Connecting to data sources

- Querying and displaying data using Apollo Client
- Connecting to Data Sources
- Creating data sources for resolvers
- Fetching data from databases, APIs, and other sources

### Lab 4: Connecting to a Data Source

- Implementing data sources for resolvers
- Fetching data from a database or external API

## Lesson 8: Creating Resolvers

- Understanding resolver functions and their role
- Implementing resolver functions for various fields

### Lab 5: Creating Resolvers

- Writing resolver functions for different fields in the schema
- Handling complex data fetching requirements

## Lesson 9: Setting up the Server for Mutations

- Understanding mutations and their purpose
- Configuring the server to handle mutation operations

### Lab 6: Setting up the Server for Mutations

- Implementing mutation resolvers
- Testing mutation operations from the server



# GraphQL

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## **Lesson 10: Making Mutations from a Client**

- Sending mutation requests from the client-side
- Handling response data and error handling

## **Lesson 11: Best Practices for GraphQL**

- Keeping the schema simple and focused
- Versioning and evolution strategies
- Caching and performance optimization techniques
- Security considerations and best practices

## **Lesson 12: Summary and Conclusion**

- Recap of key concepts and learnings
- Further learning resources
- Questions and discussion

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