

KOENIG SOLUTIONS • COURSE OUTLINE

# Restful API Development

Learn to design, secure, document and manage RESTful APIs, from HTTP fundamentals to hypermedia and lifecycle governance.

**5 Days**

DURATION

**10**

MODULES

**44**

TOPICS

## COURSE OVERVIEW

This course covers the principles of RESTful architecture and HTTP, including methods, headers, status codes and URL structure. It then examines the building blocks of RESTful APIs such as resources, CRUD operations, authentication, rate limiting and CORS, followed by design principles including URI conventions, versioning, pagination and error handling. Further modules address API documentation and testing with tools such as Swagger and Postman, security practices including JWT and OAuth, and hypermedia concepts such as HATEOAS. The final modules cover caching, asynchronous processing, webhooks, testing and monitoring, and API governance and lifecycle management.

## WHO THIS COURSE IS FOR

API Developers

Backend Developers

Software Engineers

QA Engineers

Solution Architects

## LEARNING OBJECTIVES

- Explain the principles and constraints of RESTful architecture
- Apply HTTP methods, headers and status codes in API requests
- Implement CRUD operations and manage resources and endpoints
- Apply authentication methods such as API keys, tokens and OAuth
- Design URIs with versioning, pagination and error handling
- Document and test APIs using Swagger, OpenAPI and Postman
- Describe HATEOAS and hypermedia-driven API navigation
- Plan API governance, versioning and lifecycle management

# 10 Modules, 44 Topics

## DAY 1

### 01

#### Introduction to REST

##### TOPICS

- What is API and REST?
- Principles of RESTful architecture
- Understanding HTTP methods (GET, POST, PUT, DELETE, etc.)
- Interacting with the database to parse/retrieve parameters
- Representational State Transfer (REST) constraints

### 02

#### HTTP Basics

##### TOPICS

- Overview of HTTP protocol
- Understanding HTTP requests and responses
- Headers, status codes, and response formats (JSON, XML, etc.)
- URL structure and query parameters

## DAY 2

### 03

#### Building Blocks of RESTful APIs

##### TOPICS

- Resources and endpoints
- CRUD operations (Create, Read, Update, Delete)
- Request payloads and data formats
- Handling authentication and authorization (API keys, tokens, OAuth)
- Rate limiting and throttling
- Handling CORS (Cross-Origin Resource Sharing)

04

## RESTful API Design Principles

### TOPICS

URI design and naming conventions · Versioning and backward compatibility · Pagination and filtering · Error handling and status codes · Idempotency

## DAY 3

05

## API Documentation and Testing

### TOPICS

- Importance of API documentation
- Tools for documenting RESTful APIs (Swagger, OpenAPI, API Blueprint)
- API testing using tools like Postman or cURL

06

## API Security and Best Practices

### TOPICS

- Authentication methods (Basic Auth, JWT, OAuth)
- Rate limiting and throttling
- Input validation and data sanitization
- API versioning and deprecation strategies
- Data Encryption

## DAY 4

07

## Hypermedia and HATEOAS

### TOPICS

- Hypermedia as the Engine of Application State (HATEOAS)
- Linking resources and navigation
- Benefits of hypermedia-driven APIs
- Practical Examples of HATEOAS

08

## Advanced API Concepts

### TOPICS

Caching and performance optimization · Asynchronous processing and messaging · Webhooks and event-driven architectures · API versioning strategies

## DAY 5

09

## API Testing and Monitoring

### TOPICS

Unit testing API endpoints · Integration testing with mocks and stubs · API monitoring and logging · Performance testing and load balancing

10

## API Governance and Lifecycle Management

### TOPICS

API governance and API management platforms · Version control and release management · API analytics and reporting · API documentation maintenance and update

### WHAT IS INCLUDED

## Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

## Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

### FLEXIBLE DELIVERY

## Learn the Way That Suits You

Classroom Training

Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

Flexi (Self-Paced)

1-on-1 Training

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