Introduction to REST APIs - TT7402

Learn to design, secure, and implement advanced REST APIs, transforming the way you interact with web technologies

Duration: 2 Days
Skill Level: Introductory
Available Format: Instructor-Led Online ; On Public Schedule

This course demystifies REST APIs, illustrating their importance in modern software architecture and their impact on enhancing application functionality and organizational efficiency

What You'll Learn

Overview

Introduction to REST APIs is a dynamic two-day hands-on course tailored for experienced object-oriented developers keen on mastering RESTful API development. This course demystifies REST APIs, illustrating their importance in modern software architecture and their impact on enhancing application functionality and organizational efficiency. You'll explore the fundamentals of RESTful architecture, understand the intricacies of HTTP methods, URI structuring, and learn the differences between REST and other web services like SOAP.

Our industry expert instructors provide real-world insights, practical advice, and problem-solving techniques, fostering confidence in your ability to implement these skills effectively in your projects. Guided by our expert practitioner, you'll explore an engaging blend of interactive lectures and hands-on labs. Start by setting up a REST environment, progressing to the development of a simple CRUD API using languages like Python or Java. Advanced sessions cover critical aspects such as API documentation, versioning, and implementing features like pagination, caching, and securing APIs. These practical exercises go beyond theory, equipping you with skills to manage complex data, handle security challenges, and integrate APIs with front-end applications.

The course emphasizes practical application, ensuring you can immediately apply these skills in your professional role. You'll exit this course with a comprehensive understanding of REST API development, from basic setup to advanced functionalities, ready to apply these skills on the job.

Objectives

This course combines engaging instructor-led presentations and useful demonstrations with valuable real-world hands-on labs and engaging group activities. Throughout the course you'll:

- **Understanding and Implementing RESTful Architecture:** Gain a thorough understanding of RESTful architecture principles, including how REST APIs function, the significance of HTTP methods and status codes, and the structure of URIs. Learn to differentiate between REST and other web services like SOAP.

- **Developing and Securing REST APIs:** Develop the skills to set up, design, and implement REST APIs using popular programming languages such as Python or Java. Learn to execute basic CRUD operations and apply essential security measures, including basic authentication and data encryption, to protect the API.

- **Effective Data Management with REST APIs:** Acquire the ability to handle data efficiently within REST APIs, including skills in JSON and XML data formats, serialization and deserialization processes, and best practices for data validation and error handling.

- **API Documentation and Versioning Techniques:** Learn to create comprehensive API documentation using tools like Swagger, understanding the importance of clear documentation in API development. Gain knowledge in API versioning strategies, handling deprecated APIs, and effectively communicating changes to API consumers.

- **Practical Application of REST APIs:** Develop hands-on experience in consuming external REST APIs, making HTTP requests, and integrating APIs with front-end applications. Learn best practices for API consumption and apply these skills to solve real-world problems, enhancing applications or organizational processes.

If your team requires different topics, additional skills or a custom approach, our team will collaborate with you to adjust the course to focus on your specific learning objectives and goals.

Audience

This introductory-level course is geared for developers, software engineers, and IT professionals who have a background in object-oriented programming and are seeking

to expand their skillset in web services and API development. These individuals are typically familiar with web development concepts and have experience working with data formats like JSON and XML. The course is especially beneficial for those in roles where integrating, securing, or optimizing web-based services and applications is a key component of their responsibilities.

Pre-Requisites

To ensure a smooth learning experience and maximize the benefits of attending this course, you should have

- Proficiency in Object-Oriented Programming (OOP): Participants should have a solid understanding of object-oriented programming principles and experience in at least one OOP language such as Java, Python, or C#. This foundation is crucial for comprehending how REST APIs interact with software applications.
- Basic Understanding of Web Development Concepts: Familiarity with fundamental web development concepts, including client-server architecture, HTTP/HTTPS protocols, and web services, is essential. This knowledge will aid in understanding how REST APIs function within the web ecosystem.
- Experience with Data Formats (JSON/XML): A basic understanding of data formats, particularly JSON and XML, is necessary. As REST APIs frequently involve data exchange in these formats, familiarity with them will be beneficial for handling API responses and requests.

Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.

Day 1: Introduction to REST APIs and Basic Implementation

1. Introduction to REST and APIs (1.5 hours)
- Overview of RESTful architecture
- Principles of REST APIs
- HTTP methods and status codes
- URI structure and naming conventions

- Differences between SOAP and REST
- Lab 1: Setting up a basic REST environment (30 mins)

2. Setting up a RESTful API (1.5 hours)
- Understanding web servers and environments
- Introduction to a programming language for REST API (e.g., Python, Java)
- Frameworks for REST API development
- Setting up a development environment
- Basic CRUD operations
- Lab 2: Creating a simple CRUD API (30 mins)

3. Working with Data in REST APIs (1.5 hours)
- JSON and XML data formats
- Serialization and deserialization
- Handling data from databases
- Data validation and error handling
- Best practices for data management
- Lab 3: Implementing data handling (30 mins)

4. API Security Basics (1.5 hours)
- Importance of API security
- Basic authentication and authorization
- Secure data transmission (HTTPS)
- Common security vulnerabilities (e.g., SQL injection)
- Best practices for secure API design
- Lab 4: Securing a simple API (30 mins)

Day 2: Advanced Concepts and Best Practices

5. Session 5: API Documentation and Versioning (1.5 hours)
- Importance of good documentation
- Tools for API documentation (e.g., Swagger)
- Versioning strategies for APIs
- Handling deprecated APIs
- Communicating changes to API consumers
- Lab 5: Documenting an API (30 mins)

6. Advanced API Features (1.5 hours)
- Pagination, filtering, and sorting

- Rate limiting and caching
- Asynchronous operations
- Webhooks and real-time updates
- Error handling and custom responses
- Lab 6: Implementing advanced features (30 mins)

7. Consuming REST APIs (1.5 hours)

- Understanding API endpoints
- Making HTTP requests
- Handling responses and parsing data
- Integration with front-end applications
- Best practices for API consumption
- Lab 7: Consuming an external API (30 mins)

8. Review and Project (1.5 hours)

- Recap of key concepts
- Discussing real-world API examples
- Q&A and clarifications
- Introduction to the final project
- Lab 8: Final project: Building

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All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels, CodeCoach.AI anytime tutor access, and rich extended learning and post training resources are provided for you in our "easy access, single source, no install required" online Learning Experience Platform (LXP), remote lab and content environment. Access periods vary by course. We'll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

For More Information

Please contact us or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.