🧪 API Testing Workbook & Assignment Guide

For SDETs, QA Engineers, and Mentors Based on: *API Testing for SDET, QA and Manual Tester* by Inder P Singh

📂 Module 1: Fundamentals of API Testing

Objective: Understand core concepts and terminology.

✅ Concepts to Master

- API endpoints and HTTP methods (GET, POST, PUT, DELETE)
- Request payloads and parameters
- Response status codes and headers
- Assertions and validation strategies

📝 Assignment

Task	Description
1	List 5 sample API endpoints and classify their HTTP methods
2	Create a table of common status codes (200, 400, 401, 500) with meanings
3	Write assertions for a sample response using Postman or REST Assured

🧪 Module 2: Functional & Security Testing

Objective: Design test cases for core functionality and security.

✅ Concepts to Master

- Positive, negative, and edge case testing
- Authentication & authorization
- Input sanitization and encryption
- Rate limiting and token expiry

📝 Assignment

Task	Description
1	Write 3 test cases for a login API (valid, invalid, expired token)
2	Simulate SQL injection and validate API response
3	Test role-based access control for a protected endpoint

🚀 Module 3: Performance & Load Testing

Objective: Evaluate API responsiveness and scalability.

✅ Concepts to Master

- Response time, load, stress, and spike testing
- Resource monitoring and caching

📝 Assignment

Task	Description
1	Use JMeter or Postman Runner to simulate 100 concurrent requests
2	Measure response time and identify bottlenecks
3	Document caching behavior for frequently accessed endpoints

🧰 Module 4: Tool-Based Automation

Objective: Practice using Postman, SoapUI, and REST Assured.

✅ Concepts to Master

- Collections, environments, and scripting in Postman
- Test suites and Groovy scripts in SoapUI
- Fluent API and JSON/XML validation in REST Assured

📝 Assignment

Tool	Task
Postman	Create a collection with chained requests and test scripts
SoapUI	Build a TestSuite with data-driven tests using Excel
REST Assured	Write a Java test for GET and POST endpoints with assertions

🧪 Module 5: Advanced Techniques

Objective: Explore parameterization, mocking, and CI integration.

✅ Concepts to Master

- Data-driven testing
- Mock servers and stubs
- CI/CD pipeline integration

📝 Assignment

Task	Description
1	Create a mock server in Postman and simulate a 500 error
2	Parameterize login tests using a JSON data file
3	Integrate REST Assured tests into a Jenkins pipeline (mock setup allowed)

🎯 Module 6: Interview Prep & Final Checklist

Objective: Prepare for real-world scenarios and interviews.

✅ Concepts to Master

- Scenario-based test design
- Error handling and logging
- Final checklist for automation readiness

📝 Assignment

Task	Description
1	Write a test case for a secured API using OAuth 2.0
2	Simulate and validate 401, 403, and 404 errors
3	Complete the final checklist for a sample API suite (template below)

📋 Final Checklist Template

Category	Checklist Item	Status
Functional	Validated all CRUD operations	✅/❌
Error Handling	Simulated error responses	✅/❌
Security	Tested invalid tokens and credentials	✅/❌
Performance	Measured response times under load	✅/❌
Automation	Created reusable scripts and reports	✅/❌