**Course Outline**

**Module 1: Introduction to .NET Core Web API Development**

* Overview of .NET Core Web API
* Installing and configuring .NET Core SDK
* Creating a new .NET Core Web API project
* Building and running a .NET Core Web API application
* Understanding the .NET Core Web API runtime and libraries

**Module 2: Building APIs and Routes**

* Understanding the HTTP protocol and RESTful API design principles
* Creating controllers and actions
* Configuring routes and route parameters
* Handling HTTP requests and responses
* Versioning APIs

**Module 3: Implementing Role-Based Authentication and Authorization**

* Configuring and using authentication and authorization middleware
* Understanding claims and roles
* Implementing authentication and authorization using JWT
* Handling authorization exceptions

**Module 4: Logging and Monitoring**

* Configuring and using logging middleware
* Best practices for logging in .NET Core Web API
* Monitoring application performance and health using Application Insights

**Module 5: Implementing Middleware**

* Understanding middleware in .NET Core Web API
* Creating and using custom middleware
* Implementing cross-cutting concerns using middleware (e.g. request/response logging, caching)

**Module 6: Exception Handling and Error Responses**

* Implementing exception filters to handle exceptions
* Returning error responses with appropriate HTTP status codes
* Best practices for exception handling in .NET Core Web API

**Module 7: Integration with Other Systems**

* Consuming and producing JSON and XML data
* Calling external APIs using HttpClient
* Implementing message queues using Azure Service Bus
* Best practices for building scalable and fault-tolerant systems

**Module 8: Testing and Debugging**

* Unit testing controllers and actions
* Integration testing with TestServer
* Debugging techniques and tools for .NET Core Web API
* Code profiling and optimization for Web API applications
* Code analysis and code quality tools

**Module 9: Deployment and DevOps**

* Packaging and deploying a .NET Core Web API application.
* Continuous integration and deployment (CI/CD)
* Building and deploying containerized applications with Docker
* Managing infrastructure with Infrastructure as Code (IaC) tools like Terraform

**Module 10: Best Practices for Collaborative Development**

* Working with source control using Git
* Code review and collaboration tools
* Writing and maintaining documentation
* Team communication and collaboration best practices