**ASP.NET**

**Course Overview**

The **ASP.NET** course introduces learners to Microsoft’s powerful, open-source web framework used to build dynamic, scalable, and secure web applications and services. ASP.NET supports multiple programming languages including C# and VB.NET, and runs on the .NET platform, enabling developers to create modern web applications with ease.

This course covers the fundamentals of ASP.NET Web Forms, MVC (Model-View-Controller) architecture, Web API, and Razor Pages. It is ideal for developers looking to build enterprise-grade websites, RESTful APIs, and cloud-based web solutions.

**Course Objectives**

By the end of this course, learners will be able to:

* Understand the architecture and components of ASP.NET.
* Develop dynamic web pages using Web Forms and MVC.
* Implement client-server communication with Web API.
* Use Razor syntax for seamless server-side page rendering.
* Manage state, authentication, and authorization.
* Work with databases using Entity Framework.
* Deploy and maintain ASP.NET applications on IIS and cloud platforms.

**Syllabus Breakdown**

**Module 1: Introduction to ASP.NET and .NET Framework**

* Overview of web development and ASP.NET’s role
* Understanding the .NET ecosystem
* Setting up the development environment (Visual Studio)
* ASP.NET application lifecycle

**Module 2: ASP.NET Web Forms**

* Web Forms architecture and controls
* Event-driven programming model
* State management: ViewState, Session, Cookies
* Form validation and user input controls
* Master pages and themes for UI consistency

**Module 3: ASP.NET MVC Framework**

* Understanding MVC architecture
* Creating models, views, and controllers
* Routing and URL patterns
* Working with strongly-typed views and layouts
* Data binding and validation
* Filters and action results

**Module 4: Razor Pages**

* Introduction to Razor syntax
* Building page-focused web applications
* Layouts, sections, and partial views
* Form handling and validation in Razor Pages

**Module 5: Web API Development**

* RESTful services and Web API basics
* Creating API controllers and routes
* Consuming and producing JSON and XML
* Authentication and authorization in APIs
* Testing and debugging Web APIs

**Module 6: Data Access with Entity Framework**

* Introduction to ORM and Entity Framework Core
* Code First and Database First approaches
* CRUD operations using LINQ
* Migrations and schema updates
* Handling relationships and navigation properties

**Module 7: Security and State Management**

* Authentication methods: Forms Authentication, Identity Framework
* Authorization and role management
* Secure data transmission (HTTPS, SSL)
* Cross-Site Scripting (XSS) and SQL Injection prevention
* Session management techniques

**Module 8: Deployment and Maintenance**

* Configuring and deploying ASP.NET applications on IIS
* Publishing to Azure and other cloud platforms
* Performance tuning and caching strategies
* Logging, error handling, and diagnostics
* Best practices for maintainable and scalable applications

**Career Opportunities**

Proficiency in ASP.NET opens doors to high-demand roles in web and software development across industries. Career paths include:

* **ASP.NET Developer**
* **Full Stack Web Developer (.NET Stack)**
* **Web Application Developer**
* **Backend Developer**
* **API Developer**
* **Cloud Solutions Developer (Azure)**
* **Software Engineer in Enterprise Environments**

Companies in **IT services, finance, healthcare, e-commerce, and government sectors** extensively use ASP.NET for robust web solutions and APIs.