1. Introduction to .NET & C# Fundamentals

A. Introduction to .NET Framework and .NET Core
B. .NET Runtime Architecture & Language Specifications
   - Common Language Runtime (CLR)
   - Common Type System (CTS)
   - Common Language Specification (CLS)
C. Intermediate Language (IL), Just-In-Time Compilation, Assemblies & Global Assembly Cache (GAC)
D. Overview of C# language fundamentals
E. C# program structure, Visual Studio setup and IDE basics

2. C# Programming Core Concepts

A. C# basic syntax, data types, variables and operators
B. Control structures: if, switch, loops (for, while, do-while)
C. Functions and methods in C#
D. Object-oriented programming (OOP):
   - Classes
   - Objects
   - Inheritance
   - Polymorphism
   - Encapsulation
   - Abstraction

PAARSH E-LEARNING
Boost your creativity

3. Advanced C# Concepts

A. Properties, indexers and events
B. Delegates and lambda expressions
C. Generics and collections (List, Dictionary)
D. Exception handling, debugging and error management
E. File I/O and serialization (XML, JSON)

4. ASP.NET Framework & Web Forms

A. Introduction to ASP.NET and its architecture
B. ASP.NET Web Forms, page lifecycle and server controls
C. State management: ViewState, Session, Cookies, Application state
D. Validation controls and user input handling

5. ASP.NET MVC & Web Application Development

A. Introduction to MVC architecture

B. Creating Controller, View, Model and routes
C. Razor syntax and view components
D. Layout pages, partial views and HTML Helpers

6. Data Access & ORM

A. Introduction to SQL Server database
B. Data access with ADO.NET
C. Entity Framework Core: setup and configuration
D. LINQ and migrations for database versioning

7. Enterprise Application Features

A. Authentication and Authorization (ASP.NET Identity, roles)
B. Security fundamentals: hashing, authorization policies
C. Session management and caching techniques
D. Handling user input and validation securely

8. Web APIs & Services

A. RESTful API development with ASP.NET Core
B. Routing and controllers for APIs
C. CRUD operations and JSON responses
D. Token based authentication (JWT)

Paarsh E-Learning
Boost your creativity

9. Deployment & Cloud Integration

A. Deploying .NET applications on Microsoft Azure
B. Configuring IIS for ASP.NET hosting
C. Containerization with Docker for .NET apps
D. CI/CD basics using Azure DevOps and GitHub Actions

10. Testing & Performance

A. Unit testing with NUnit or xUnit
B. Debugging techniques in Visual Studio
C. Performance optimization and error-handling patterns
D. Load testing and logging practices

Practical:

- Build a full enterprise web application with ASP.NET MVC
- Develop REST API with ASP.NET Core
- Integrate Entity Framework for database operations
- Deploy applications to cloud and CI/CD pipelines