

.NET Syllabus

For Summer Training Program



What is .NET?

.NET is a software development framework created by Microsoft that supports building and running applications on Windows, Linux, and macOS. It provides a large class library called the .NET Class Library, and supports several programming languages, primarily C#, VB.NET, and F#.

Key Features:

- Cross-platform: Build apps that run on Windows, Linux, and macOS.
- Multiple Language Support: Mainly C#, but also supports VB.NET, F#, etc.
- Rich Libraries: Offers built-in libraries for security, file I/O, database access, etc.
- Unified Development: One platform for Web, Desktop, Mobile, and Cloud apps.
- Modern & Fast: Uses the latest programming features and performs well.

Common Uses of .NET:

- Web applications (using ASP.NET or Blazor)
- Desktop applications (using Windows Forms or WPF)
- Mobile apps (using .NET MAUI or Xamarin)
- Cloud services (Azure integration)
- APIs and microservices

.NET is a free, open-source, cross-platform software development platform developed by Microsoft that allows developers to build a wide range of applications, including web, desktop, mobile, cloud, and IoT solutions. It provides a unified environment where different programming languages, such as C#, VB.NET, and F#, can be used to write applications. Originally introduced as the .NET Framework for Windows-only development, the platform has evolved into a modern and powerful system with the release of .NET Core and now the unified ".NET" version (starting from .NET 5 and beyond), which supports Windows, Linux, and macOS. The core part of .NET is the Common Language Runtime (CLR), which manages memory, handles exceptions, and ensures security. Alongside this, the .NET Class Library offers a large collection of reusable code that simplifies common programming tasks like file handling, database interaction, web requests, and more.

.NET also supports modern development patterns like object-oriented programming, dependency injection, asynchronous programming, and RESTful APIs.

It includes powerful tools like Visual Studio and Visual Studio Code, which provide developers with intelligent code completion, debugging, and integrated version control. One of the most widely used components of .NET is ASP.NET Core, which allows developers to build high-performance web applications and APIs.



HTML : MODULE 1

Introduction:

- What is HTML?
 1. Definition and importance of HTML
 2. Role of HTML in web development
 3. Overview of how HTML works with CSS and JavaScript
- History Of HTML ?
 1. Evolution of HTML from HTML 1.0 to HTML5
 2. Key milestones and developments in HTML history
 3. Impact of HTML advancements on web development
- Basic Structures of a Web Page
 1. Fundamental structure of an HTML document
 2. Understanding the `<!DOCTYPE html>` declaration
 3. Introduction to HTML elements and attributes

HTML Head Tags:

- Purpose and Use of the `<head>` Section
 1. Common head tags: `<title>`, `<meta>`, `<link>`, `<style>`, `<script>`, `<meta viewport="">`
 2. Using meta tags for SEO and responsive design

HTML Body Tags:

- Structure and Purpose of the `<body>` Section
 1. Creating and organising content within the body
 2. Basic HTML tags for structuring web pages

HTML Basic Tags:

- `
` and `<hr>` Tags
 1. Usage and examples of line breaks with `
`
 2. Creating horizontal rules with `<hr>`
- `<p>`, `<h1>` to `<h6>`, `<a>`, ``, ``, ``, ``, `<div>`, ``, ``, ``, `<table>`, `<tr>`, `<td>`, `<th>`, `<form>`, `<input>`, `<button>`

HTML Link Creation:

- HTML Anchor Tags
 1. Creating hyperlinks with the `<a>` tag
 2. Understanding `href` attribute and link destinations
 3. Opening links in new tabs or windows with `target` attribute

HTML Tables

- HTML Tables
 1. Constructing tables with `<table>`, `<tr>`, `<td>`, and `<th>` tags
 2. Basic table structure and usage

```

<!DOCTYPE html>
<html>
  <head>
    <title>Wikitechy div tag</title>
  </head>
  <body>
    <h2>Wikitechy HTML div tag.
    <div style="color: red">
      <h2>This is a heading in
      <p> This is a paragraph i
    </div>
  </body>
</html>

```

- HTML Nested Tables
 1. Creating tables within tables
 2. Managing nested table layouts
- HTML Merging Cells
 1. Merging table cells with **colspan** and **rowspan** attributes
 2. Practical examples of cell merging
- HTML Text Wrapping
 1. Wrapping text within table cells
 2. Handling overflow and text alignment
- HTML Table Background Image
 1. Adding background images to tables or cells
 2. Customising table aesthetics with background images
- HTML Table Cell Alignment
 1. Aligning text and content within table cells
 2. Using **align** and **valign** attributes

HTML : MODULE 2

HTML Lists:

- HTML Unordered Lists
 1. Creating bulleted lists with ****
 2. Using **** for list items
 3. Styling unordered lists
- HTML Ordered Lists
 1. Creating numbered lists with ****
 2. List item customization and attributes
 3. Nested lists and their formatting

HTML Image Insertion:

- Inserting Images with the **** Tag
 1. Understanding **src** and **alt** attributes
 2. Image dimensions and alignment

HTML Embedding Videos:

- Embedding Videos Using the **<video>** Tag
 1. Video attributes: **controls**, **autoplay**, **loop**, **muted**
 2. Supporting different video formats

HTML Forms:

- Introduction to Forms
 1. Purpose and structure of HTML forms
 2. Basic form elements and their roles

The screenshot shows a web form titled "Application Form" with a blue header and a light blue body. The form is divided into two main sections: "A. General Questions" and "B. Type of Health Coverage".

Section A: General Questions

- Proposed Insured's Name: (text input)
- Birth Date: (text input with slashes for day/month/year)
- Gender: (radio buttons for Male and Female)
- Address: (text input)
- Phone Number: (text input)
- Email Address: (text input)
- ID Number: (text input)
- Social Security Number: (text input)
- Status: (radio buttons for Single, Married, Divorced, Others)
- Occupation: (text input)
- Are you a retiree?: (radio buttons for Yes and No)

Section B: Type of Health Coverage

- Employee: (radio buttons for Yes and No)
- Spouse: (radio buttons for Yes and No)
- Children: (radio buttons for Yes and No)
- Plan Choice: (text input)

Below these sections is a table for "Complete if Spouse/Children are Proposed for Insurance:"

Name	SSN No.	Relationship to proposed insured	Birth Date	Age	Sex

- HTML Form Tags and Attributes
 1. Essential form tags: `<form>`, `<input>`, `<label>`, `<fieldset>`
 2. Understanding form attributes: `action`, `method`, `name`, `id`
- HTML Forms - Post vs. Get
 1. Differences between `POST` and `GET` methods
 2. Appropriate use cases for each method
- HTML Forms - Input Text Fields
 1. Creating text input fields with `<input type="text">`
 2. Attributes for text fields: `placeholder`, `maxlength`, `required`
- HTML Forms - Select Menus
 1. Creating drop-down lists with `<select>` and `<option>` tags
 2. Handling multi-select menus
- HTML Forms - Checkboxes and Radio Buttons
 1. Using `<input type="checkbox">` and `<input type="radio">`
 2. Grouping radio buttons for exclusive selection
- HTML Forms - Text Areas and Buttons
 1. Creating multi-line text input with `<textarea>`
 2. Adding buttons: `<button>`, `<input type="submit">`, `<input type="reset">`

HTML iframes:

- Embedding External Content with the `<iframe>` Tag
 1. Adjusting iframe attributes: `src`, `width`, `height`, `frameborder`
 2. Security and sandboxing considerations

CSS : MODULE 1

Introduction:

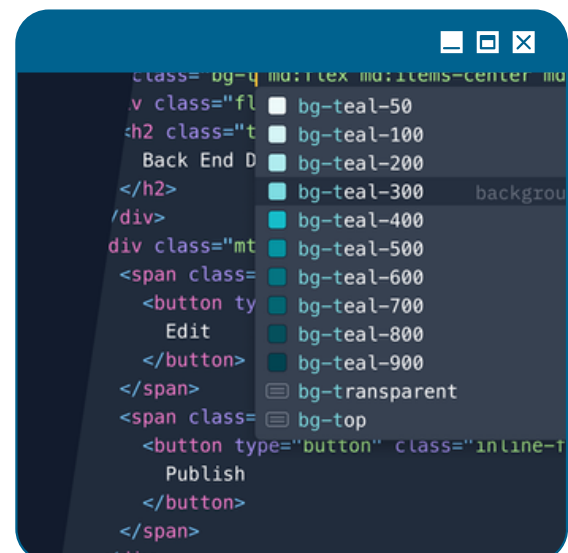
- What is CSS?
- Why use CSS?
- CSS syntax and structure

Types of CSS:

- Inline CSS
- Internal/Embedded CSS
- External CSS

CSS Selectors:

- Element selectors
- Class selectors
- ID selectors
- Attribute selectors
- Grouping selectors



CSS : MODULE 2

CSS Box Model:

- Understanding the box model (margin, border, padding, content)
- Box-sizing property

Layout Techniques:

- Block vs. inline elements
- Display property (block, inline, inline-block, flex, grid)
- Positioning (static, relative, absolute, fixed)

Typography:

- Fonts and text properties
- Text alignment
- Text decoration and transformation

Typography:

- Fonts and text properties
- Text alignment
- Text decoration and transformation

CSS : MODULE 3

Colors and Backgrounds:

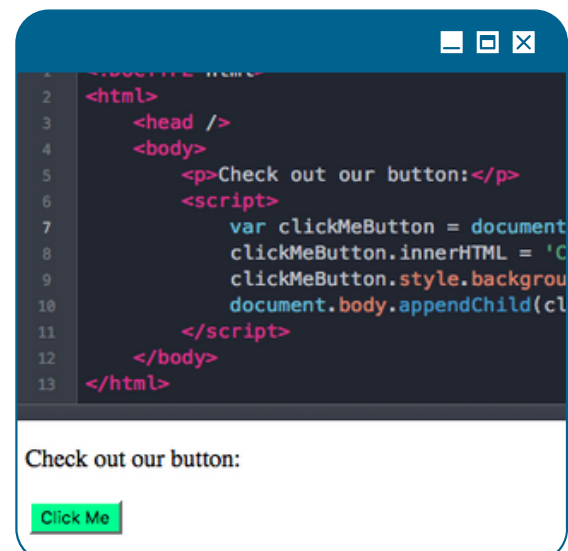
- Color properties (color, background-color)
- Using gradients
- Background images and positioning

Responsive Design:

- Media queries
- Viewport units (vw, vh)
- Responsive units (em, rem)

CSS Transitions and Animations:

- Transition properties (transition, transition-property, etc.)
- Keyframes and animation properties
- Creating basic animations



BOOTSTRAP : MODULE 1

Foundations of Bootstrap:

- **Introduction to Bootstrap:** Overview of Bootstrap and its importance in web development.
- **Embedding Bootstrap:** Methods to include Bootstrap in web projects (CDN, local files).
- **Bootstrap:** Basic Page Structure: Setting up the basic HTML structure for a Bootstrap project.

Layout and Grid System:

- **Bootstrap Grid System:** Understanding the grid system, containers, rows, and columns.
- **Bootstrap Three Column Layouts:** Creating responsive three-column layouts.

Typography and Tables:

- **Bootstrap Typography:** Styling text using Bootstrap classes.
- **Bootstrap Tables:** Creating and styling tables.

BOOTSTRAP : MODULE 2

Images and Utilities:

- **Bootstrap Styling Images:** Enhancing images with Bootstrap classes.
- **Bootstrap Jumbotron:** Creating attention-grabbing content blocks.

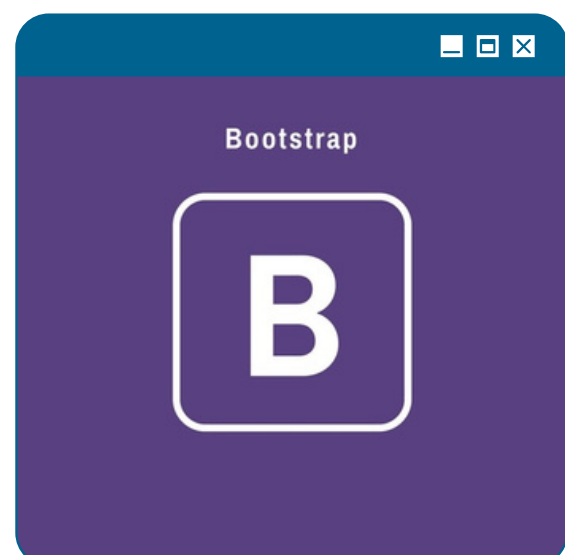
Alerts and Buttons:

- **Bootstrap Alerts:** Implementing alert messages.
- **Bootstrap Buttons:** Styling and customizing buttons.
- **Bootstrap Button Groups and Justified Button Groups:** Grouping and justifying buttons.

BOOTSTRAP : MODULE 3

Navigation Components:

- **Bootstrap Pagination and Pager Pagination:** Implementing pagination controls.
- **Bootstrap List Groups:** Creating list groups for content.



- **Bootstrap Dropdown Menus:** Creating dropdown menus.

Tabs and Menus:

- **Bootstrap Tab Menus and Pill Menus:** Implementing tabbed navigation.
- **Bootstrap Dynamic Tabs and Pills:** Creating dynamic tabs and pills.
- **Bootstrap Dropdown Menus:** Creating dropdown menus.

Forms and Inputs:

- **Bootstrap Forms:** Vertical and Inline: Designing forms using Bootstrap.
- **Bootstrap Inputs: Customizing form inputs.**
- **Bootstrap Form Control States:** Managing input states (valid, invalid, disabled).
- **Bootstrap Input Sizing:** Adjusting the size of form inputs.

JAVASCRIPT : MODULE 1

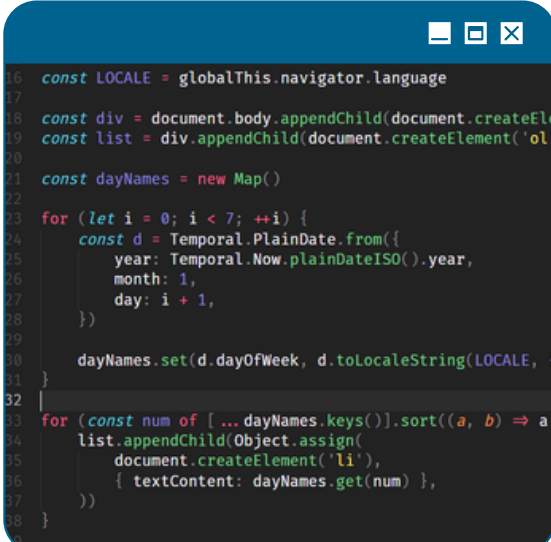
Introduction: In this module we will learn about what JavaScript is and the benefits of the language. We can also learn how to write the first JavaScript program.

- JavaScript Introduction
- First Javascript program
- Benefits of Javascript

JAVASCRIPT : MODULE 2

Language Syntax: In this module we will learn about JavaScript language syntax and how to use the program level. And we can also learn to understand the arrays.

- Variable declaration
- Operators
- Control Statements
- Error Handling
- Understanding arrays
- Function Declaration



```

16 const LOCALE = globalThis.navigator.language
17
18 const div = document.body.appendChild(document.createElement('div'))
19 const list = div.appendChild(document.createElement('ol'))
20
21 const dayNames = new Map()
22
23 for (let i = 0; i < 7; ++i) {
24   const d = Temporal.PlainDate.from({
25     year: Temporal.Now.plainDateISO().year,
26     month: 1,
27     day: i + 1,
28   })
29   dayNames.set(d.dayOfWeek, d.toLocaleString(LOCALE, {
30   })
31 }
32
33 for (const num of [...dayNames.keys()].sort((a, b) => a < b)) {
34   list.appendChild(Object.assign(
35     document.createElement('li'),
36     {.textContent: dayNames.get(num)}),
37   ))
38 }

```


JAVASCRIPT : MODULE 3

HTML Forms: In this module we will learn about how to use the forms. What are the properties in JavaScript? HTML form validation can be done by JavaScript.

- HTML Document object Model
- Working with HTML form and its elements

JAVASCRIPT : MODULE 4

HTML DOM: In this module we will learn about how JavaScript can access and change all the elements of an HTML document.

- HTML Document object Model
- Working with HTML form and its elements

.NET INTRODUCTION AND ENVIRONMENT SETUP

Getting Started

- Introduction
- MVC Architecture Pattern
- Setting up the development Environment
- Your First ASP.NET MVC App
- MVC in Action
- Adding a Theme

ASP.NET MVC Fundamentals

- Introduction
- Action Results
- Action Parameters
- Convention-based Routing
- Attribute Routing
- Passing Data to Views
- View Models

PLANNING THE APP : MODULE 3

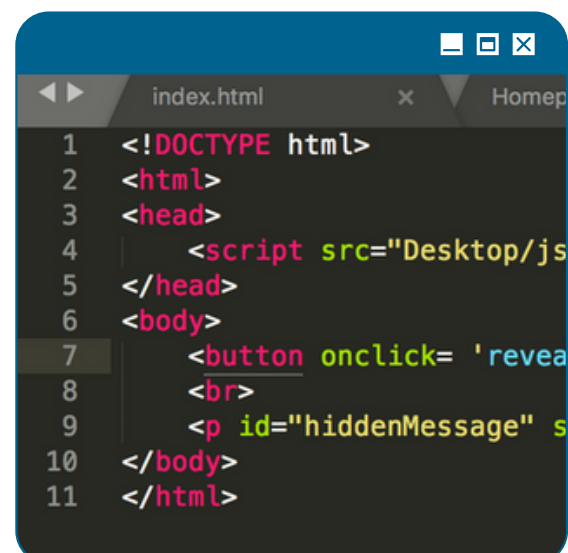
Module Introduction

Understanding the General App Idea

Sketching out the Frontend

Data & API Endpoints used in our App

Required SPA Pages for the Frontend



```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <script src="Desktop/js"
5 </head>
6 <body>
7   <button onclick= 'revea
8   <br>
9   <p id="hiddenMessage" s
10 </body>
11 </html>
```

Overview of the ASP.NET MVC Stack for the Project

- ASP.NET MVC (backend and frontend framework)
- MS SQL Server (relational database)
- HTML, CSS, JavaScript/jQuery (for frontend UI)

Setting up the Folder Structure for an ASP.NET MVC Project

- Models – data models
- Views – frontend HTML/CSS (Razor views)
- Controllers – backend logic
- Scripts, Content – JS and CSS files

Installing Necessary Dependencies for Backend

- EntityFramework (for database operations)
- Newtonsoft.Json (for API handling)
- CloudinaryDotNet (for image upload if using Cloudinary)

Creating a Git Repository for Version Control

- Initialize a Git repository to track project versions and collaborate efficiently.

Backend Development (ASP.NET MVC + Entity Framework + MS SQL Server)

- Set up models and controllers in ASP.NET MVC to handle user input, image generation requests, and data storage in SQL Server.

Setting up Unsplash API, Cloudinary, and SQL Credentials

Obtain credentials for Unsplash API or Cloudinary. Store sensitive data (API keys, connection strings) in Web.config.

```
var xhr = new XMLHttpRequest();
xhr.onreadystatechange = function() {
    if (xhr.readyState === 4) {
        if (xhr.status === 200) {
            // any response code
        }
    }
}
xhr.open(HttpMethod, url, async);
xhr.send(string);
```

Creating Controller Actions for Fetching and Storing Images

- Call image generation API
- Upload images to Cloudinary (optional)
- Save image URLs and prompt history to SQL Server

Frontend Development (HTML/CSS + JavaScript)

- Use HTML/CSS to design a user interface with a prompt box, image display area, and history list. Enhance interactivity using JavaScript or jQuery.

Setting up Razor Views and Custom UI Design

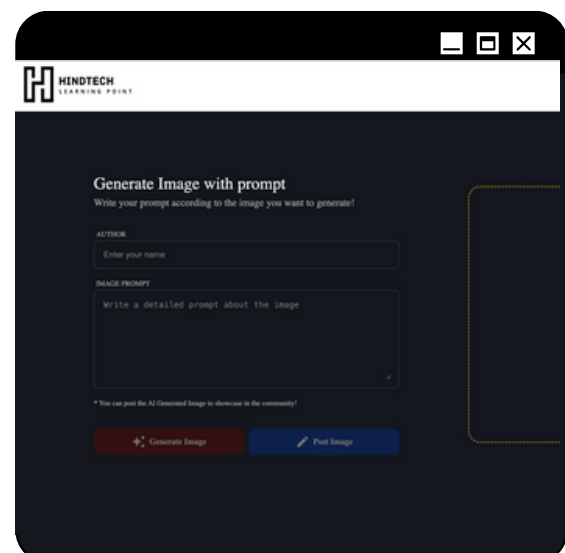
- Create .cshtml Razor views using your HTML/CSS design and bind data using @model.

Integrate Frontend and Backend, Display Fetched/Generated Images

- Use controller responses and Razor views to render image results on the same or redirected page dynamically.

Deployment

- Deploy the project on IIS, Azure App Service, or any Windows hosting that supports ASP.NET MVC and SQL Server.



PROJECT VIEW

NOTES



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📍 Building No 10/703, Ground Floor, near Arvindo Park Road, Sector 10, Indira Nagar, Lucknow, Uttar Pradesh 226016

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