

**PROGRAMA DE ESTUDIO DE:**  
**“PROGRAMACIÓN Y DESARROLLO DE APLICACIONES SOBRE TECNOLOGÍA**  
**WEB**

**Año: 2017**

**I.-GENERALIDADES**

<b>Código</b>	<b>CEIC</b>	<b>Horas teóricas semanales</b>	<b>3</b>
<b>Duración del ciclo</b>	<b>8 Meses</b>	<b>Horas prácticas semanales</b>	<b>3.6</b>

**II. DESCRIPCIÓN DEL CURSO ESPECIALIZADO**

Este curso se encuentra integrado por módulos para el desarrollo del curso de especialización en programación desde un entorno básico hasta avanzado de aplicaciones web, utilizando las nuevas tecnologías de desarrollo.

**III. OBJETIVO GENERAL**

Que el estudiante obtenga los conocimientos necesarios para poder certificarse en el uso de tecnologías para el desarrollo de aplicaciones basadas en un entorno web.

**IV. MÓDULOS DE ESTUDIO:**

**MÓDULO No. I: Programming Fundamentals of Web Applications**

**Objetivo:**

**Contenido:**

**1. Overview of Microsoft Web Technologies**

- 1.1. Introduction to Web Fundamentals
- 1.2. Introduction to the Microsoft Web Stack
- 1.3. Introduction to the Open Source Application Gallery

**2. Exploring WebMatrix 2**

- 2.1. The Project Life Cycle

- 2.2. Introduction to the Microsoft WebMatrix 2
- 3. **Building Simple Websites in WebMatrix 2**
  - 3.1. Building Web Pages in WebMatrix 2
  - 3.2. Using Razor Syntax to Build Dynamic Pages
- 4. **Building Data-Driven Websites in WebMatrix 2**
  - 4.1. Introduction to Databases
  - 4.2. Creating a Database in WebMatrix 2
  - 4.3. Displaying Data
- 5. **Adding Rich Content to WebMatrix 2 Websites**
  - 5.1. Adding Media Content
  - 5.2. Using HTML5 in a Website
- 6. **Designing the WebMatrix 2 Website**
  - 6.1. Structuring a Website
  - 6.2. Applying Template Views
  - 6.3. Applying Styles to a Website
  - 6.4. Adapting a Site for Mobile Browsers
- 7. **Deploying a WebMatrix 2 Web Applications**
  - 7.1. Hosting Web Applications
  - 7.2. Hosting Databases
  - 7.3. Deploying to your Chosen Locations
- 8. **Troubleshooting WebMatrix 2 Web Applications**
  - 8.1. Sources of Errors
  - 8.2. Using the Microsoft Internet Explorer Developer Tools
  - 8.3. Troubleshooting Problems
- 9. **Consuming Services and Data from the Web**
  - 9.1. Calling Web Services from a Web Application
  - 9.2. Public Data Sources
- 10. **Enriching a WebMatrix 2 Web Application by Using Open Source Components**
  - 10.1. Overview of Open Source Packages in NuGet
  - 10.2. Browsing, Installing, and Using Packages
- 11. **Securing a WebMatrix 2 Website**
  - 11.1. Developing Websites that Resist Attack
  - 11.2. Controlling Access to a Website
  - 11.3. Working with Roles and Memberships
- 12. **Building Responsive Webpages**
  - 12.1. Why Use Client-side Scripts?
  - 12.2. The jQuery Script Libraries
  - 12.3. Using AJAX and Partial Page Updates
  - 12.4. Optimizing Caches to Improve Performance
- 13. **Driving Traffic to a WebMatrix 2 Website**
  - 13.1. Growing a Website
  - 13.2. Analyzing a WebMatrix 2 Application
  - 13.3. Optimizing a WebMatrix 2 Application for Search Engines
  - 13.4. Marketing an Application

## **14. Customizing an Application from the WebMatrix 2 Gallery**

- 14.1. Exploring the Application Gallery
- 14.2. Modifying an Existing Application
- 14.3. **Transitioning from WebMatrix 2 to Visual Studio**
- 14.4. Developing Websites in Visual Studio
- 14.5. Moving Between WebMatrix 2 and Visual Studio

## **MÓDULO No. II: PROGRAMMING IN HTML5 WITH JAVASCRIPT AND CSS3**

### **Objetivo:**

Este curso proporciona una introducción a HTML5, CSS3 y JavaScript. Ayuda a los estudiantes a adquirir habilidades de programación HTML5/CSS3/JavaScript básicas. Este curso es un punto de entrada a la aplicación Web y aplicaciones Windows Store. El curso se centra en el uso de HTML5/CSS3/JavaScript para implementar la lógica de programación, definir y utilizar variables, realizar bucles y ramificaciones, desarrollar interfaces de usuario, capturar y validar la entrada del usuario, almacenar datos y crear aplicaciones bien estructuradas.

### **Contenido:**

#### **1. Overview of HTML and CSS**

- 1.1. Overview of HTML
- 1.2. Overview of CSS
- 1.3. Creating a Web Application by Using Visual Studio 2012

#### **2. Creating and Styling HTML5 Pages**

- 2.1. Creating an HTML5 Page
- 2.2. Styling an HTML5 Page

#### **3. Introduction to JavaScript**

- 3.1. Overview of JavaScript Syntax
- 3.2. Programming the HTML DOM with JavaScript
- 3.3. Introduction to jQuery

#### **4. Creating Forms to Collect Data and Validate User Input**

- 4.1. Overview of Forms and Input Types
- 4.2. Validating User Input by Using HTML5 Attributes
- 4.3. Validating User Input by Using JavaScript
- 4.4. Create forms that use the new HTML5 input types.
- 4.5. Validate user input and provide feedback by using the new HTML5 attributes.
- 4.6. Write JavaScript code to validate user input and provide feedback in cases where it is not suitable to use HTML5 attributes

#### **5. Communicating with a Remote Data Source**

- 5.1. Sending and Receiving Data by Using XML HTTP Request
- 5.2. Sending and Receiving Data by Using jQuery AJAX operations

## **6. Styling HTML5 by Using CSS3**

- 6.1. Styling Text
- 6.2. Styling Block Elements
- 6.3. CSS3 Selectors
- 6.4. Enhancing Graphical Effects by Using CSS3

## **7. Creating Objects and Methods by Using JavaScript**

- 7.1. Writing Well-Structured JavaScript
- 7.2. Creating Custom Objects
- 7.3. Extending Objects

# **MÓDULO No. III: PROGRAMMING ADVANCED IN HTML5 WITH JAVASCRIPT AND CSS3**

### **Objetivo:**

Este curso proporciona los temas avanzados para aprender a programar en HTML5, CSS3 y JavaScript. Ayuda a los estudiantes a adquirir herramientas y técnicas avanzadas de programación HTML5/CSS3/JavaScript...

### **Contenido:**

#### **1. Creating Interactive Pages using HTML5 APIs**

- 1.1. Interacting with Files
- 1.2. Incorporating Multimedia
- 1.3. Reacting to Browser Location and Context
- 1.4. Debugging and Profiling a Web Application

#### **2. Adding Offline Support to Web Applications**

- 2.1. Reading and Writing Data Locally
- 2.2. Adding Offline Support by Using the Application Cache
- 2.3. Save and retrieve data locally by using the Local Storage API.
- 2.4. Provide offline Support for a Web application by using the Application Cache API.

#### **3. Implementing an Adaptive User Interface**

- 3.1. Supporting Multiple Form Factors
- 3.2. Creating an Adaptive User Interface

#### **4. Creating Advanced Graphics**

- 4.1. Creating Interactive Graphics by Using Scalable Vector Graphics
- 4.2. Programmatically Drawing Graphics by Using a Canvas

#### **5. Animating the User Interface**

- 5.1. Applying CSS Transitions
- 5.2. Transforming Elements

- 5.3. Applying CSS Key-frame Animations
- 6. Implementing Real-Time Communications by Using Web Sockets**
  - 6.1. Introduction to Web Sockets
  - 6.2. Sending and Receiving Data by Using Web Sockets
- 7. Creating a Web Worker Process**
  - 7.1. Introduction to Web Workers
  - 7.2. Performing Asynchronous Processing by Using a Web Worker

## MODULO NO. IV: PROGRAMMING IN C#

### Objetivo:

Este curso enseña las habilidades de programación que se requieren para que los desarrolladores creen aplicaciones Windows utilizando el lenguaje C#. Los estudiantes revisaran los conceptos básicos de la estructura del programa C #, la sintaxis del lenguaje y los detalles de la implementación, y luego consolidan sus conocimientos mientras construyen una aplicación que incorpora varias características de .NET Framework 4.5. Al final del curso, los estudiantes deben dejar la clase con un sólido conocimiento de C # y cómo usarlo para desarrollar aplicaciones .NET Framework 4.5. Este curso utiliza Visual Studio 2012

### Contenido:

- 1. Review of C# Syntax**
  - 1.1. Overview of Writing Applications using C#
  - 1.2. Datatypes, Operators, and Expressions
  - 1.3. C# Programming Language Constructs
- 2. Creating Methods, Handling Exceptions, and Monitoring Applications**
  - 2.1. Creating and Invoking Methods
  - 2.2. Creating Overloaded Methods and Using Optional and Output Parameters
  - 2.3. Handling Exceptions
  - 2.4. Monitoring Applications
- 3. Developing the Code for a Graphical Application**
  - 3.1. Implementing Structs and Enums
  - 3.2. Organizing Data into Collections
  - 3.3. Handling Events
- 4. Creating Classes and Implementing Type-safe Collections**
  - 4.1. Creating Classes
  - 4.2. Defining and Implementing Interfaces
  - 4.3. Implementing Type-safe Collections
- 5. Creating a Class Hierarchy by Using Inheritance**
  - 5.1. Creating Class Hierarchies

- 5.2. Extending .NET Framework Classes
- 5.3. Creating Generic Types
- 5.4. Create generic classes and methods.
- 6. Reading and Writing Local Data**
  - 6.1. Reading and Writing Files
  - 6.2. Serializing and Deserializing Data
  - 6.3. Performing I/O Using Streams
- 7. Accessing a Database**
  - 7.1. Creating and Using Entity Data Models
  - 7.2. Querying Data by Using LINQ
  - 7.3. Updating Data by Using LINQ
- 8. Accessing Remote Data**
  - 8.1. Accessing Data Across the Web
  - 8.2. Accessing Data in the Cloud
- 9. Designing the User Interface for a Graphical Application**
  - 9.1. Using XAML to Design a User Interface
  - 9.2. Binding Controls to Data
  - 9.3. Styling a User Interface
- 10. Improving Application Performance and Responsiveness**
  - 10.1. Implementing Multitasking by using Tasks and Lambda Expressions
  - 10.2. Performing Operations Asynchronously
  - 10.3. Synchronizing Concurrent Access to Data
- 11. Integrating with Unmanaged Code**
  - 11.1. Creating and Using Dynamic Objects
  - 11.2. Managing the Lifetime of Objects and Controlling Unmanaged Resources
- 12. Creating Reusable Types and Assemblies**
  - 12.1. Examining Object Metadata
  - 12.2. Creating and Using Custom Attributes
  - 12.3. Generating Managed Code
  - 12.4. Versioning, Signing and Deploying Assemblies
- 13. Encrypting and Decrypting Data**
  - 13.1. Implementing Symmetric Encryption
  - 13.2. Implementing Asymmetric Encryption

## **MODULO NO. V: DEVELOPING ASP.NET MVC 4 WEB APPLICATIONS**

### **Objetivo:**

En este curso, los estudiantes aprenderán a desarrollar aplicaciones avanzadas de ASP.NET MVC utilizando herramientas y tecnologías de .NET Framework 4.5. El enfoque se centrará en las actividades de codificación que mejoran el rendimiento y la escalabilidad de una aplicación web. ASP.NET MVC será introducido y comparado con Web Forms para que los estudiantes sepan cuándo deberían / podrían utilizarse. Este curso también preparará a los estudiantes para el examen 70-486.

### **Contenido:**

#### **1. Exploring ASP.NET MVC4**

- 1.1. Overview of Microsoft Web Technologies
- 1.2. Overview of ASP.NET 4.5
- 1.3. Introduction to ASP.NET MVC 4

#### **2. Designing ASP.NET MVC 4 Web Applications**

- 2.1. Planning in the Project Design Phase
- 2.2. Designing Models, Controllers, and Views

#### **3. Developing ASP.NET MVC 4 Models**

- 3.1. Creating MVC Models
- 3.2. Working with Data

#### **4. Developing ASP.NET MVC 4 Controllers**

- 4.1. Writing Controllers and Actions
- 4.2. Writing Action Filters

#### **5. Developing ASP.NET MVC 4 Views**

- 5.1. Creating Views with Razor Syntax
- 5.2. Using HTML Helpers
- 5.3. Reusing Code in Views

#### **6. Testing and Debugging ASP.NET MVC 4 Web Applications**

- 6.1. Unit Testing MVC Components
- 6.2. Implementing an Exception Handling Strategy

#### **7. Structuring ASP.NET MVC 4 Web Applications**

- 7.1. Analyzing Information Architecture
- 7.2. Configuring Routes
- 7.3. Creating a Navigation Structure

#### **8. Applying Styles to ASP.NET MVC 4 Web Applications**

- 8.1. Using Template Views
- 8.2. Applying CSS to an MVC Application
- 8.3. Creating an Adaptive User Interface

#### **9. Module 9: Building Responsive Pages in ASP.NET MVC 4 Web Applications**

- 9.1. Using AJAX and Partial Page Updates
- 9.2. Implementing a Caching Strategy

- 10. Using JavaScript and jQuery for Responsive MVC 4 Web Applications**
  - 10.1. Rendering and Executing JavaScript Code
  - 10.2. Using jQuery and jQueryUI
- 11. Controlling Access to ASP.NET MVC 4 Web Applications**
  - 11.1. Implementing Authentication and Authorization
  - 11.2. Assigning Roles and Membership
- 12. Building a Resilient ASP.NET MVC 4 Web Application**
  - 12.1. Developing Secure Sites
  - 12.2. State Management
- 13. Using Windows Azure Web Services in ASP.NET MVC 4 Web Applications**
  - 13.1. Introducing Windows Azure
  - 13.2. Designing and Writing Windows Azure Services
  - 13.3. Consuming Windows Azure Services in a Web Application
- 14. Implementing Web APIs in ASP.NET MVC 4 Web Applications**
  - 14.1. Developing a Web API
  - 14.2. Calling a Web API from Mobile and Web Applications
- 15. Handling Requests in ASP.NET MVC 4 Web Applications**
  - 15.1. Using HTTP Modules and HTTP Handlers
  - 15.2. Using Web Sockets
- 16. Deploying ASP.NET MVC 4 Web Applications**
  - 16.1. Deploying a Web Application
  - 16.2. Deploying an ASP.NET MVC 4 Web Application



## V. EVALUACIÓN

Los participantes de la especialización se someterán a una prueba objetiva de evaluación por cada módulo que consistirá en un test de batería que evalúe todos los niveles del conocimiento (cognoscitivo, afectivo y psicomotor).

## VI.- ESTRATEGIAS METODOLÓGICAS

Clases prácticas, discusiones, ejemplos y estudio de casos.

## VII. BIBLIOGRAFÍA

- Programming Fundamentals of Web Applications
- Programming in HTML5 with JavaScript and CSS3
- Programming Advanced in HTML5 with JavaScript and CSS3
- Programming in C#
- Developing ASP.NET MVC 4 Web Applications

## VIII. CERTIFICACION MICROSOFT

Todos los cursos estructurados en este plan de especialización, preparan al estudiante para someterse a los exámenes y obtener la certificación:

**“Microsoft Certified Solutions Associate” (MCSA)**



Aprobado por: Lic. Rolando Balmore Pacheco  
Dirección de Egresados y Graduados  
Fecha: Febrero de 2017

Elaborado por: Marco Antonio Gonzalez  
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