

Curso de Especialización Administración y Desarrollo de Base de datos e Inteligencia de Negocios

I.-GENERALIDADES

Código		Duración del Curso de Especialización	8 meses
Nº de horas	240	Identificación del ciclo	01 -2015
Horas teóricas semanales	3	Carreras	Ingeniería en Ciencias de la Computación, Licenciatura en Sistemas de Computación Administrativa.
Horas prácticas semanales	3.6		

II. DESCRIPCIÓN DEL CURSO ESPECIALIZADO

Este curso se encuentra integrado por módulos para el desarrollo del curso de especialización en la administración de un servidor de base de datos desde el uso de lenguaje de consultas y transacciones a la base de datos, implementación del servidor, hasta la creación de bases de datos analíticas para la inteligencia de negocios.

III. OBJETIVO GENERAL

Que el estudiante obtenga los conocimientos necesarios para poder certificarse en el uso de tecnologías de administración de base de datos, y de tecnologías para el desarrollo de datos para Inteligencia de Negocios.

IV. MÓDULOS DE ESTUDIO:

MÓDULO No. I: QUERYING MICROSOFT SQL SERVER

Objetivo:

Este curso proporciona a los estudiantes con las habilidades técnicas necesarias para escribir consultas de Transact-SQL básicas para Microsoft SQL Server. Este curso es la base para todas las disciplinas relacionadas con SQL Server; es decir, administración de base de datos, desarrollo de base de datos y Business Intelligence.

Contenido:

1. Introduction to Microsoft SQL Server

1.1. Introducing Microsoft SQL Server

- 1.2. Getting Started with SQL Server Management Studio
- 2. Getting Started with SQL Azure**
 - 2.1. Overview of SQL Azure
 - 2.2. Working with SQL Azure
- 3. Introduction to T-SQL Querying**
 - 3.1. Introducing T-SQL
 - 3.2. Understanding Sets
 - 3.3. Understanding Predicate Logic
 - 3.4. Understanding the Logical Order of Operations in SELECT statements
- 4. Writing SELECT Queries**
 - 4.1. Writing Simple SELECT Statements
 - 4.2. Eliminating Duplicates with DISTINCT
 - 4.3. Using Column and Table Aliases
 - 4.4. Writing Simple CASE Expressions
- 5. Querying Multiple Tables**
 - 5.1. Understanding Joins
 - 5.2. Querying with Inner Joins
 - 5.3. Querying with Outer Joins
 - 5.4. Querying with Cross Joins and Self Joins
- 6. Sorting and Filtering Data**
 - 6.1. Sorting Data
 - 6.2. Filtering Data with a WHERE Clause
 - 6.3. Filtering with the TOP and OFFSET-FETCH Options
 - 6.4. Working with Unknown and Missing Values
- 7. Working with SQL Server Data Types**
 - 7.1. Introducing SQL Server Data Types
 - 7.2. Working with Character Data
 - 7.3. Working with Date and Time Data
- 8. Using Built-In Functions**
 - 8.1. Writing Queries with Built-In Functions
 - 8.2. Using Conversion Functions
 - 8.3. Using Logical Functions
 - 8.4. Using Functions to Work with NULL
- 9. Grouping and Aggregating Data**
 - 9.1. Using Aggregate Functions
 - 9.2. Using the GROUP BY Clause
 - 9.3. Filtering Groups with HAVING
- 10. Using Subqueries**
 - 10.1. Writing Self-Contained Subqueries
 - 10.2. Writing Correlated Subqueries
 - 10.3. Using the EXISTS Predicate with Subqueries
- 11. Using Table Expressions**
 - 11.1. Using Derived Tables
 - 11.2. Using Common Table Expressions
 - 11.3. Using Views
 - 11.4. Using Inline Table-Valued Functions
- 12. Using Set Operators**
 - 12.1. Writing Queries with the UNION Operator
 - 12.2. Using EXCEPT and INTERSECT
 - 12.3. Using APPLY

13. Using Window Ranking, Offset and Aggregate Functions

- 13.1. Creating Windows with OVER
- 13.2. Exploring Window Functions

14. Pivoting and Grouping Sets

- 14.1. Writing Queries with PIVOT and UNPIVOT
- 14.2. Working with Grouping Sets
- 14.3. Write queries which specify multiple groupings with grouping sets

15. Querying SQL Server Metadata

- 15.1. Querying System Catalog Views and Functions
- 15.2. Executing System Stored Procedures
- 15.3. Querying Dynamic Management Objects

16. Executing Stored Procedures

- 16.1. Querying Data with Stored Procedures
- 16.2. Passing Parameters to Stored Procedures
- 16.3. Creating Simple Stored Procedures
- 16.4. Working with Dynamic SQL

17. Programming with T-SQL

- 17.1. T-SQL Programming Elements
- 17.2. Controlling Program Flow

18. Implementing Error Handling

- 18.1. Using TRY / CATCH Blocks
- 18.2. Working with Error Information

19. Implementing Transactions

- 19.1. Transactions and the Database Engine
- 19.2. Controlling Transactions

20. Improving Query Performance

- 20.1. Factors in Query Performance
- 20.2. Displaying Query Performance Data

MODULO No. II: DEVELOPING MICROSOFT SQL SERVER DATABASES

Objetivos:

Este curso presenta SQL Server y describe los planes de diseño, indexación y consulta de tabla lógica. También se centra en la creación de objetos de base de datos, incluidas las vistas, procedimientos almacenados, junto con los parámetros y funciones. Otros aspectos comunes de la codificación del procedimiento, tales como transacciones, concurrencia, manejo de errores y desencadenadores CLR de SQL también están cubiertos en este curso.

Contenido:

1. Introduction to SQL Server and its Toolset

- 1.1. Verifying SQL Server Component Installation
- 1.2. Altering Service Accounts for New Instance
- 1.3. Enabling Named Pipes Protocol for Both Instances
- 1.4. Creating an Alias for AdvDev
- 1.5. Ensuring SQL Browser is Disabled and Configure a Fixed TCP/IP Port

2. Working with Data Types

- 2.1. Using Data Types
- 2.2. Working with Character Data
- 2.3. Converting Data Types

- 2.4. Specialized Data Types
- 3. Designing and Implementing Tables**
 - 3.1. Designing Tables
 - 3.2. Working with Schemas
 - 3.3. Creating and Altering Tables
- 4. Ensuring Data Integrity through Constraints**
 - 4.1. Enforcing Data Integrity
 - 4.2. Implementing Domain Integrity
 - 4.3. Implementing Entity and Referential Integrity
- 5. Planning for SQL Server Indexing**
 - 5.1. Core Indexing Concepts
 - 5.2. Data Types and Indexes
 - 5.3. Single Column and Composite Indexes
- 6. Implementing Table Structures in SQL Server**
 - 6.1. SQL Server Table Structures
 - 6.2. Working with Clustered Indexes
 - 6.3. Designing Effective Clustered Indexes
- 7. Reading SQL Server Execution Plans**
 - 7.1. Execution Plan Core Concepts
 - 7.2. Common Execution Plan Elements
 - 7.3. Working with Execution Plans
- 8. Improving Performance through Nonclustered Indexes**
 - 8.1. Designing Effective Nonclustered Indexes
 - 8.2. Implementing Nonclustered Indexes
 - 8.3. Using the Database Engine Tuning Advisor
- 9. Designing and Implementing Views**
 - 9.1. Introduction to Views
 - 9.2. Creating and Managing Views
 - 9.3. Performance Considerations for Views
- 10. Designing and Implementing Stored Procedures**
 - 10.1. Introduction to Stored Procedures
 - 10.2. Working With Stored Procedures
 - 10.3. Implementing Parameterized Stored Procedures
 - 10.4. Controlling Execution Context
- 11. Merging Data and Passing Tables**
 - 11.1. Using the MERGE Statement
 - 11.2. Implementing Table Types
 - 11.3. Using TABLE Types As Parameters
- 12. Designing and Implementing User-Defined Functions**
 - 12.1. Overview of Functions
 - 12.2. Designing and Implementing Scalar Functions
 - 12.3. Designing and Implementing Table-Valued Functions
 - 12.4. Implementation Considerations for Functions
 - 12.5. Alternatives to Functions
- 13. Creating Highly Concurrent SQL Server Applications**
 - 13.1. Introduction to Transactions
 - 13.2. Introduction to Locks
 - 13.3. Management of Locking
 - 13.4. Transaction Isolation Levels
- 14. Handling Errors in T-SQL Code**

- 14.1. Understanding T-SQL Error Handling
- 14.2. Implementing T-SQL Error Handling
- 14.3. Implementing Structured Exception Handling
- 15. Responding to Data Manipulation via Triggers**
 - 15.1. Designing DML Triggers
 - 15.2. Implementing DML Triggers
 - 15.3. Advanced Trigger Concepts
- 16. Implementing Managed Code in SQL Server**
 - 16.1. Introduction to SQL CLR Integration
 - 16.2. Importing and Configuring Assemblies
 - 16.3. Implementing SQL CLR Integration
- 17. Storing XML Data in SQL Server**
 - 17.1. Introduction to XML and XML Schemas
 - 17.2. Storing XML Data and Schemas in SQL Server
 - 17.3. Implementing the XML Data Type
 - 17.4. Implement the XML data type within SQL Server.
- 18. Querying XML Data in SQL Server**
 - 18.1. Using the T-SQL FOR XML Statement
 - 18.2. Getting Started with XQuery
 - 18.3. Shredding XML
- 19. Working with SQL Server Spatial Data**
 - 19.1. Introduction to Spatial Data
 - 19.2. Working with SQL Server Spatial Data Types
 - 19.3. Using Spatial Data in Applications
- 20. Working with Full-Text Indexes and Queries**
 - 20.1. Introduction to Full-Text Indexing
 - 20.2. Implementing Full-Text Indexes in SQL Server
 - 20.3. Working with Full-Text Queries

MODULO No. III: ADMINISTERING MICROSOFT SQL SERVER DATABASES

Objetivos:

Este curso provee a los estudiantes los conocimientos y habilidades para preparar el entorno e instalar el servidor de base de datos de Microsoft SQL Server. El curso se centra en la enseñanza de cómo utilizar SQL Server, sus características y herramientas relacionadas con el mantenimiento de una base de datos.

Contenido:

- 1. Introduction to SQL Server and its Toolset**
 - 1.1. Introduction to the SQL Server Platform
 - 1.2. Working with SQL Server Tools
 - 1.3. Configuring SQL Server Services
- 2. Preparing Systems for SQL Server**
 - 2.1. Overview of SQL Server Architecture
 - 2.2. Planning Server Resource Requirements
 - 2.3. Pre-installation Testing for SQL Server
- 3. Installing and Configuring SQL Server**

- 3.1. Preparing to Install SQL Server
- 3.2. Installing SQL Server
- 3.3. Upgrading and Automating Installation
- 4. Working with Databases**
 - 4.1. Overview of SQL Server Databases
 - 4.2. Working with Files and Filegroups
 - 4.3. Moving Database Files
- 5. Understanding SQL Server Recovery Models**
 - 5.1. Backup Strategies
 - 5.2. Understanding SQL Server Transaction Logging
 - 5.3. Planning a SQL Server Backup Strategy
- 6. Backup of SQL Server Databases**
 - 6.1. Backing up Databases and Transaction Logs
 - 6.2. Managing Database Backups
 - 6.3. Working with Backup Options
- 7. Restoring SQL Server Databases**
 - 7.1. Understanding the Restore Process
 - 7.2. Restoring Databases
 - 7.3. Working with Point-in-time recovery
 - 7.4. Restoring System Databases and Individual Files
- 8. Automating SQL Server Management**
 - 8.1. Automating SQL Server Management
 - 8.2. Working with SQL Server Agent
 - 8.3. Managing SQL Server Agent Jobs
- 9. Configuring Security for SQL Server Agent**
 - 9.1. Understanding SQL Server Agent Security
 - 9.2. Configuring Credentials
 - 9.3. Configuring Proxy Accounts
- 10. Monitoring SQL Server with Alerts and Notifications**
 - 10.1. Configuration of Database Mail
 - 10.2. Monitoring SQL Server Errors
 - 10.3. Configuring Operators, Alerts and Notifications

MODULO No. IV: MAINTAINING A MICROSOFT SQL SERVER DATABASES.

Objetivo:

Este curso provee a los estudiantes los conocimientos y habilidades para importar y exportar datos de una base de datos de Microsoft SQL Server. Adicionalmente aprenderán a configurar permisos y a autorizar usuarios con roles, para el acceso a la información de la base de datos.

Contenido:

- 1. Importing and Exporting Data**
 - 1.1. Transferring Data To/From SQL Server
 - 1.2. Importing and Exporting Table Data
 - 1.3. Inserting Data in Bulk

- 2. Authenticating and Authorizing Users**
 - 2.1. Authenticating Connections to SQL Server
 - 2.2. Authorizing Logins to Access Databases
 - 2.3. Authorization Across Servers
- 3. Assigning Server and Database Roles**
 - 3.1. Working with Server Roles
 - 3.2. Working with Fixed Database Roles
 - 3.3. Creating User-defined Database Roles
- 4. Authorizing Users to Access Resources**
 - 4.1. Authorizing User Access to Objects
 - 4.2. Authorizing Users to Execute Code
 - 4.3. Configuring Permissions at the Schema Level
- 5. Auditing SQL Server Environments**
 - 5.1. Options for Auditing Data Access in SQL
 - 5.2. Implementing SQL Server Audit
 - 5.3. Managing SQL Server Audit
- 6. Performing Ongoing Database Maintenance**
 - 6.1. Ensuring Database Integrity
 - 6.2. Maintaining Indexes
 - 6.3. Automating Routine Database Maintenance
- 7. Tracing Access to SQL Server**
 - 7.1. Capturing Activity using SQL Server Profiler
 - 7.2. Improving Performance with the Database Engine Tuning Advisor
 - 7.3. Working with Tracing Options
- 8. Monitoring SQL Server**
 - 8.1. Monitoring Activity
 - 8.2. Capturing and Managing Performance Data
 - 8.3. Analyzing Collected Performance Data
- 9. Managing Multiple Servers**
 - 9.1. Working with Multiple Servers
 - 9.2. Virtualizing SQL Server
 - 9.3. Deploying and Upgrading Data-Tier Applications
- 10. Troubleshooting Common SQL Server Administrative Issues**
 - 10.1. SQL Server Troubleshooting Methodology
 - 10.2. Resolving Service-related Issues
 - 10.3. Resolving Concurrency Issues
 - 10.4. Resolving Login and Connectivity Issues

MODULO No. V: IMPLEMENTING A DATA WAREHOUSE WITH MICROSOFT SQL SERVER.

Objetivos:

Data warehousing es una solución, para que las organizaciones lo utilicen para centralizar los datos empresariales para reporting y análisis. Este curso se centra en enseñar a los estudiantes a crear un almacén de datos con SQL Server, ETL con SQL Server Integration Services, e implementar y validar la limpieza de datos con servicios de calidad de datos de SQL Server y SQL Server Master Data Services.

Contenido:

1. **Introduction to Data Warehousing**
 - 1.1. Overview of Data Warehousing
 - 1.2. Considerations for a Data Warehouse Solution
2. **Data Warehouse Hardware**
 - 2.1. Considerations for Building a Data Warehouse
 - 2.2. Data Warehouse Reference Architectures and Appliances
3. **Designing and Implementing a Data Warehouse**
 - 3.1. Logical Design for a Data Warehouse
 - 3.2. Physical Design for a Data Warehouse
4. **Creating an ETL Solution with SSIS**
 - 4.1. Introduction to ETL with SSIS
 - 4.2. Exploring Source Data
 - 4.3. Implementing Data Flow
5. **Implementing Control Flow in an SSIS Package**
 - 5.1. Introduction to Control Flow
 - 5.2. Creating Dynamic Packages
 - 5.3. Using Containers
 - 5.4. Managing Consistency
6. **Debugging and Troubleshooting SSIS Packages**
 - 6.1. Debugging an SSIS Package
 - 6.2. Logging SSIS Package Events
 - 6.3. Handling Errors in an SSIS Package
7. **Implementing an Incremental ETL Process**
 - 7.1. Introduction to Incremental ETL
 - 7.2. Extracting Modified Data
 - 7.3. Loading Modified Data
8. **Incorporating Data from the Cloud into a Data Warehouse**
 - 8.1. Overview of Cloud Data Sources
 - 8.2. SQL Server Database
 - 8.3. The Windows Azure Marketplace
9. **Enforcing Data Quality**
 - 9.1. Introduction to Data Quality
 - 9.2. Using Data Quality Services to Cleanse Data
 - 9.3. Using Data Quality Services to Match Data
10. **Using Master Data Services**
 - 10.1. Introduction to Master Data Services
 - 10.2. Implementing a Master Data Services Model
 - 10.3. Using the Master Data Services Add-in for Excel
11. **Extending SQL Server Integration Services**
 - 11.1. Using Custom Components in SSIS
 - 11.2. Using Scripts in SSIS
12. **Deploying and Configuring SSIS Packages**
 - 12.1. Overview of SSIS Deployment
 - 12.2. Deploying SSIS Projects
 - 12.3. Planning SSIS Package Execution
13. **Consuming Data in a Data Warehouse**
 - 13.1. Introduction to Business Intelligence
 - 13.2. Introduction to Reporting

13.3. Introduction to Data Analysis

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

- QUERYING MICROSOFT SQL SERVER.
- DEVELOPING MICROSOFT SQL SERVER DATABASES.
- ADMINISTERING MICROSOFT SQL SERVER DATABASES.
- MAINTAINING A MICROSOFT SQL SERVER DATABASES.
- IMPLEMENTING A DATA WAREHOUSE WITH MICROSOFT SQL SERVER

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: 28 de febrero de 2015.