<u>LINQ Syllabus</u>

Overview: LINQ – Language Integrated Query is a way to write queries on various data sources specially collection of objects, sql database, xml document. The queries syntax is very similar to SQL queries and includes similar features like sorting, filtering, grouping, joining and calculating. LINQ now is an integral part of C# language features and internals of it are depended on Extension methods and delegates topics**.**

Course Objectives:

❖ Leverage new features of C# 3.0, including extension methods and lambda expressions.

❖ Understand LINQ Architecture and Role to LINQ Providers

❖ Use LINQ to filter, sort, and group in-memory collections of objects.

❖ Perform CRUD operations using LINQ to SQL

❖ Create LINQ to SQL queries to execute SQL Server stored procedures.

❖ Understand how to resolve concurrency conflicts with LINQ to SQL.

❖ To deal with Transactions using LINQ

❖ Using Linq to DataSet for retrieving data from DataSet.

❖ Write LINQ to XML queries to search XML documents and save them to the file system.

❖ Build a real-world n-tier application using LINQ to SQL.

Pre-requisite / Target Audience:

❖ must be having knowledge of C# programming language and basic knowledge of SQL Server.

Module 1: LINQ Centric C# Language Extensions

The most significant attribute of anonymous types in conjunction with LINQ is that they support hierarchical data shaping without writing all of the plumbing code or resorting to SQL. A partial class splits the definition of a class over two or more source files. You can create a class definition in multiple files but it will be compiled as one class.

The LINQ extension methods are one of the tools available to .NET developers in version 3.5 to expedite and simplify working with collections.

❖ Anonymous Types

❖ Partial Classes

❖ Extension Methods

Module 2: Linq Architecture

LINQ makes the concept of querying a first-class programming concept in .NET. The data to be queried can take the form of XML (LINQ to XML), databases (LINQ-enabled ADO.NET: LINQ to SQL, LINQ to Dataset and LINQ to Entities) and objects (LINQ to Objects).

❖ Linq Architecture

Module 3: Linq Queries

A query is an expression that retrieves data from a data source. Queries are usually expressed in a specialized query language. Different languages have been developed over time for the various types of data sources, for example SQL for relational databases and XQuery for XML. LINQ simplifies this situation by offering a consistent model for working with data across various kinds of data sources and formats.

- ❖ Linq Queries Syntax
- ❖ Lambda Expressions
- ❖ Linq Queries over Custom Collections

Module 4: Linq to SQL

LINQ to SQL, a component of Visual Studio Code Name "Orcas", provides a run-time infrastructure for managing relational data as objects without losing the ability to query. It does this by translating language-integrated queries into SQL for execution by the database, and then translating the tabular results back into objects you define. Your application is then free to manipulate the objects while LINQ to SQL stays in the background tracking your changes automatically.

- ❖ Linq to Sql
- ❖ Performing CRUD Operations
- ❖ Performing CRUD Operations Using Joins
- ❖ Delay Loading
- ❖ Dealing with Concurrency Issues
- ❖ Linq and Stored Procedure
- ❖ Performing CRUD Operation Using Stored Operation
- ❖ Transaction Handling

Module 5: Linq To DataSet

LINQ to DataSet makes it easier and faster to query over data cached in a DataSet object. These queries are expressed in the programming language itself, rather than as string literals embedded in the application code. This means that developers do not have to learn a separate query language. LINQ to DataSet can also be used to query over data that has been consolidated from one or more data sources.

- ❖ Linq to Dataset

Module 6: LINQ To XML

LINQ to XML targets a variety of developers. For an average developer who just wants to get something done, LINQ to XML makes XML easier by providing a query experience that is similar to SQL. With just a bit of study, programmers can learn to write succinct and powerful queries in their programming language of choice.

- ❖ Linq to XML

At the end of the course participants will be able to

1. Create and execute LINQ queries on data sets

2. Query databases

3. Use advanced libraries and approaches for data querying

4. Perform ad hoc data queries on in-memory and external data sources

5. Write your own LINQ operators