# Tech Vision *Solving industry challenges*

## Course Outline for C#.Net programming with Object-Oriented concepts

**COURSE OUTLINE**

| # | Chapters & Strategies | Session # | Topics |
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| 1 | **.NET: What You Need To Know** | 1 | .NET Executables and the CLR<br>A .NET Test bed for C# Programming<br>Using Visual Studio |
| 2 | **First C# Programs** | 2 | Hello, World<br>Namespaces<br>Variables and Expressions<br>Using C# as a Calculator<br>Input/Output in C#<br>.NET Framework Class Library |
| 3 | **Data Types in C#** | 2 | Data Types<br>Integer Types<br>Floating Point Types<br>Decimal Type<br>Characters and Strings<br>Boolean Type<br>Conversions |
| 4 | **Operators and Expressions** | 2 | Operator Cardinality<br>Arithmetic Operators<br>Relational Operators<br>Logical Operators<br>Assignment Operators<br>Expressions |
| 5 | **Control Structures** | 2 | If Tests<br>Loops<br>Arrays<br>Foreach<br>More about Control Flow |

| | | | Switch |
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| 6 | **Object-Oriented Programming** | 3 | Objects<br>Classes<br>Inheritance<br>Polymorphism<br>Object-Oriented Languages<br>Components |
| 7 | **Classes** | 3 | Classes as Structured Data<br>Methods<br>Constructors and Initialization<br>Static Fields and Methods<br>Constant and Readonly |
| 8 | **More about Types** | 3 | Overview of Types in C#<br>Value Types<br>Boxing and Unboxing<br>Reference Types |
| 9 | **Methods, Properties and Operators** | 3 | Methods<br>Parameter Passing<br>Method Overloading<br>Variable-Length Parameter Lists<br>Properties<br>Operator Overloading |
| 10 | **Characters and Strings** | 4 | Characters<br>Strings<br>String Input<br>String Methods<br>StringBuilder Class<br>Programming with Strings |
| 11 | **Arrays and Indexers** | 4 | Arrays<br>System.Array<br>Random Number Generation<br>Jagged Arrays<br>Rectangular Arrays<br>Arrays as Collections |

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| | | | Bank Case Study - Step 1<br>Indexers |
| 12 | **Inheritance** | 4 | Single Inheritance<br>Access Control<br>Method Hiding<br>Initialization<br>Bank Case Study - Step 2 |
| 13 | **Virtual Methods and Polymorphism** | 5 | Virtual Methods and Dynamic Binding<br>Method Overriding<br>Fragile Base Class Problem<br>Polymorphism<br>Abstract Classes<br>Sealed Classes<br>Heterogeneous Collections<br>Bank Case Study - Step 3 |
| 14 | **Formatting and Conversion** | 5 | ToString<br>Format Strings<br>String Formatting Methods<br>Bank Case Study - Step 4<br>Type Conversions |
| 15 | **Exceptions** | 5 | Exception Fundamentals<br>Structured Exception Handling<br>User-Defined Exception Classes<br>Inner Exceptions<br>Bank Case Study - Step 5 |
| 16 | **Interfaces** | 6 | Interface Fundamentals<br>Programming with Interfaces<br>Using Interfaces at Runtime<br>Bank Case Study - Step 6<br>Resolving Ambiguities |
| 17 | **.NET Interfaces and Collections** | 6 | Collections<br>Bank Case Study - Step 7<br>IEnumerable and IEnumerator<br>Copy Semantics and ICloneable |

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| | | | Comparing Objects<br>Generic Types<br>Type-Safe Collections<br>Bank Case Study - Step 8 |
| 18 | **Additional C# Features** | | Auto-Implemented Properties<br>Implicitly Typed Variables<br>Object Initializers<br>Collection Initializers<br>Anonymous Types<br>Partial Methods<br>Extension Methods<br>Lambda Expressions<br>Language-Integrated Query (LINQ) |