



REG NO. II-81-1306

# THE SOURCE CODE



SOFTWARE SOLUTION

Address:

Anjuman Complex, First Floor, Shop No. D - 11 A, Beside Anjuman College of Engineering & Technology, Sadar Bazar, Nagpur - 440001.

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### Visual Studio and .NET (C#) Syllabus:

#### Introduction to .NET [Concept]

1. Introduction.
2. Microsoft's Windows Operating system.
3. C, C++, objective C and Java.
4. C#.
5. Extensible Markup Language (XML)
6. Introduction to Microsoft .NET.
7. The .NET framework and the Common Language Runtime.
8. Test Driving the Advanced Painter Application.
9. Introduction to Object Technology.
10. Wrap-Up.

#### Introduction to C# Application [CODE]

1. Introduction
2. A simple C# Application: Displaying a line of text.
3. Creating a simple C# application in visual studio 2010.
4. Modifying your simple C# application.
5. Formatting text with console.WriteLine and console.WriteLine.
6. Another C# Application: Adding integers.
7. Arithmetic.
8. Decision Making: Equality and Relational Operators.
9. Wrap-Up.

#### Introduction to Classes & Objects [CODE]

1. Introduction.
2. Classes, Objects, Methods, Properties and Instance Variable.
3. Declaring a Class with a Method and Instantiating an object of a class.
4. Declaring a Method with a Parameter.
5. Instance Variable and Properties.
6. UML Class Diagram with properties.
7. Software Engineering with Properties and set and get assessors.
8. Auto implemented Properties.
9. Value Type Vs Reference Type.
10. Initializing object with constructor.
11. Floating-Point Numbers and Type Decimal.
12. Wrap-Up.

#### Control Statements – 1 [CODE]

1. Introduction.
2. Control Structure.
3. if..... Single-Selection Statement.
4. If.....else Double-Selection Statement.
5. While Repetition Statement.
6. Counter-Controlled Repetition.
7. Sentinel-Controlled Repetition.

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8. Nested Controlled Statements.
9. Compound Assignment Operators.
10. Increment Decrement Operators.
11. Simple Type.
12. Wrap-Up.

#### **Control Statements – 2 [CODE]**

1. Introduction.
2. Essentials of Counter-Controlled Repetition.
3. for..... Repetition Statement.
4. Example using the “for” Statement.
5. Do.....While Repetition Statement.
6. Switch Multiple Selection Statement.
7. Break and Continue Statement.
8. Logical Operators.
9. Wrap-Up.

#### **Methods: A Deeper Look [CODE]**

1. Introduction.
2. Packaging Code in C#.
3. Static Methods, Static Variables, Class Math.
4. Declaring Method with multiple parameters.
5. Notes on Declaring and Using Methods.
6. Method – Call stack and Activation Records.
7. Argument Promotion and Casting.
8. The .NET Framework and class library.
9. Scope of Declaration.
10. Method Overloading.
11. Optional Parameter.
12. Named Parameter.
13. Recursion.
14. Passing Parameter: Pass by value Vs Pass by Reference.
15. Wrap-Up.

#### **Arrays: [CODE]**

1. Introductions.
2. Types of Arrays.
3. Declaring and Creating Arrays.
4. Example using Arrays.
5. foreach Statements.
6. Passing Arrays and Array Elements to Methods.
7. Passing Arrays by value and by Reference.
8. Multidimensional Array.
9. Variable Length argument list.
10. Using Command Line arguments.
11. Wrap-Up.

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## **Introduction to LINQ and the List Collection: [DATA STRUCTURE]**

1. Introduction.
2. Querying an array of int values using LINQ.
3. Querying an array of Employee Objects using LINQ.
4. Introduction to Collections.
5. Querying a Generic Collection using LINQ.
6. Wrap-Up.

## **Classes and Objects: A deeper Look [CODE]**

1. Introduction.
2. Time Class Case Study.
3. Controlling Access to members.
4. Referring to current object's member with the "this" reference.
5. Indexers.
6. Overloaded constructors.
7. Default and Parameterless constructors.
8. Compositions.
9. Garbage Collections and Destructors.
10. Static class members.
11. ReadOnly Instance variable.
12. Data Abstraction and Encapsulation.
13. Creating Class Libraries.
14. Internal Access.
15. Class View and Object Browser.
16. Object Initializers.
17. Extension Methods.
18. Delegates.
19. Lambda Expressions.

## **Object Oriented Programming: Inheritance. [CONCEPT & CODE]**

1. Introduction.
2. Base Class and Derived Class.
3. Protected members.
4. Relationship between Base Class and Derived class.
  - a. Creating and using a CommissionEmployee Class.
  - b. Creating a BasePlusCommissionEmployee Class without using inheritance.
  - c. Creating a CommissionEmployee – BasePlusCommissionEmployee Inheritance hierarchy.
  - d. CommissionEmployee – BasePlusCommissionEmployee Inheritance hierarchy using protected instance variables.
  - e. CommissionEmployee – BasePlusCommissionEmployee Inheritance hierarchy using private instance variables.
5. Constructor in Derived Class.
6. Software engineering with Inheritance.
7. Wrap-Up.



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## Object Oriented Programming: Polymorphism, Interfaces and Operator Overloading. [CODE]

1. Introduction.
2. Polymorphism Examples.
3. Demonstrating Polymorphic Behavior.
4. Abstract Classes and Methods.
5. Case Study: Payroll system using polymorphism.
  - a. Creating Abstract Base Class Employee.
  - b. Creating Concrete Derived Class SalariedEmp.
  - c. Creating Concrete Derived Class HourlyEmp.
  - d. Creating Concrete Derived Class CommissionEmp.
  - e. Creating Indirect Concrete Derived Class BasePlusCommissionEmployee.
  - f. Polymorphic processing, Operator "is" and Downcasting.
  - g. Summary of the allowed Assignments Between Base – Class and Derived – Class variables.
6. Sealed Methods and classes.
7. Case Study: Creating and using interfaces.
  - a. Developing an IPayable hierarchy.
  - b. Declaring Interface IPayable.
  - c. Creating class Invoice.
  - d. Modifying class Employee to implement interface IPayable.
  - e. Modifying class SalariedEmp to use with IPayable.
  - f. Using interface IPayable to process Invoice and Employee polymorphically.
  - g. Common interfaces of the .NET framework class library.
8. Operator Overloading.
9. Wrap-Up.

## Exception Handling [CODE]

1. Introduction.
2. Example: Divide by Zero without exception handling.
3. Example: Handling DivideByZeroException and FormatExceptions.
  - a. Enclosing Code in a try block.
  - b. Catching Exception.
  - c. Uncaught Exception.
  - d. Termination model of Exception handling.
  - e. Flow of Control when exceptions occur.
4. .NET Exception Hierarchy
  - a. Class SystemException
  - b. Determining which exception a method throws.
5. The "finally" block.
6. The "using" Statement.
7. Exception Properties.
8. User Defined Exception Classes.
9. Wrap – Up.

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## Generics [CONCEPT & CODE]

1. Introduction.
2. Motivation for Generic Methods.
3. Generic – Methods Implementation.
4. Type Constraint.
5. Overloading Generic Methods.
6. Generic Classes.
7. Wrap – Up.

## Collections [DATA STRUCTURE & CODE/CONCEPT]

1. Introduction.
2. Collection Overview.
3. Class Array and Enumerators.
4. Non – Generic Collections.
  - a. Class ArrayList.
  - b. Class Stack.
  - c. Class Hash – Table.
5. Generic Collections.
  - a. Generic Class SortedDictionary.
  - b. Generic Class LinkedList.
6. Covariance and Contravariance for Generic Type.
7. Wrap – Up.

## Strings and Character [CODE]

1. Introduction.
2. Fundamental of String and Character.
3. String Constructors.
4. String Indexer, Length property, and CopyTo Method.
5. Comparing Strings.
6. Locating character and Substring in strings.
7. Extracting Substring form a string.
8. Concatenating strings.
9. Miscellaneous string Methods.
10. Class StringBuilders.
11. Length and Capacity properties, EnsureCapacity Method and Indexer of Class StringBuilder.
12. Append and AppendFormat Methods of class StringBuilder.
13. Insert, Remove and replace Methods of class StringBuilder.
14. Char Methods.
15. Regular Expression.
  - a. Simple Regular Expressions and Class Regex.
  - b. Complex Regular Expression.
  - c. Validating User Input with Regular Expression and LINQ.
  - d. Regex Methods “Replace” and “Split”.
16. Wrap – Up.

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## GUI with Windows Forms: Part 1 [DESIGNING]

1. Introduction.
2. Windows Form.
3. Event Handling.
  - a. A simple Event – Driven GUI.
  - b. Visual Studio Generated GUI Code.
  - c. Delegates and Event Handling Mechanism.
  - d. Another way to create event handling.
  - e. Locating Event Information.
4. Control Properties and Layouts.
5. Labels, Textboxes, and Buttons.
6. GroupBoxes and Panels.
7. CheckBoxes and Radio Buttons.
8. Picture Boxes.
9. Tool Tips.
10. NumericUpDown Control.
11. Mouse Event – Handling.
12. Keyboard Event – Handling.
13. Wrap – Up.

## GUI with Windows Forms: Part 2 [DESIGNING]

1. Introduction.
2. Menus.
3. MonthCalendar Control.
4. DateTime Picker Control.
5. LinkLabel Control.
6. ListBox Control.
7. CheckedListBox Control.
8. ComboBox Control.
9. TreeView Control.
10. ListView Control.
11. TabControl Control.
12. Multiple Document Interface (MDI) Window.
13. Visual Inheritance.
14. User Defined Controls.

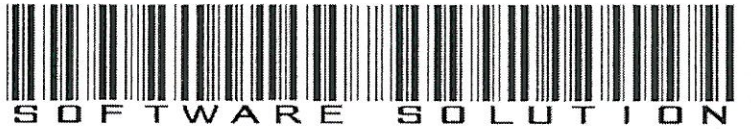
## Database and LINQ [DATABASE]

1. Introduction.
2. Relational Database.
3. A Book Database.
4. LINQ to SQL.
5. Querying a database with LINQ.
  - a. Creating LINQ to SQL Classes.
  - b. DataBinding between controls and the LINQ to SQL Classes.



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6. Dynamically Binding Query Results
  - a. Creating the Display Query Results GUI.
  - b. Coding the Display Query Results Application.
7. Retrieving Data from multiple Tables with LINQ
8. Creating a Master/Detail View Application.
  - a. Creating Master/Detail GUI.
  - b. Coding Master/Detail Application.
9. Tools and the Web Resources.
10. Wrap – Up.

### **Web App Development with ASP .NET [WEB DESIGNING & CODE]**

1. Introduction.
2. Web Basics.
3. Multitier Application Architecture.
4. Your First Web Application.
  - a. Building the WebTime Application.
  - b. Examining the WebTime.aspx's Code Behind File.
5. Standard web controls: Designing a web form.
6. Validation Controls.
7. Session Tracking.
  - a. Cookies.
  - b. Session tracking with HttpSessionState
  - c. Options.aspx: Selecting a program language.
  - d. Recommendations.aspx: Displaying recommendations based on session values.

### **Web App Development with ASP .NET: A deeper Look [WEB DESIGNING & DATABASE/CODE]**

1. Introduction.
2. Case Study: Password Protected Books Database Application.
  - a. Examining the ASP .NET website Template.
  - b. Test – Driving the completed application.
  - c. Configuring the website.
  - d. Modifying the Default.aspx and About.aspx Pages.
  - e. Creating a content page that only authenticated users can access.
  - f. Linking from the Default.aspx page to the Books.aspx page.
  - g. Modifying the Master Page (site.master).
  - h. Customizing the password – protected books.aspx Page.
3. ASP .NET: Ajax
  - a. Traditional Web application.
  - b. Ajax web application.
  - c. Testing an asp .net web application.
  - d. The asp .net Ajax Control Toolkit.
  - e. Using control form the Ajax toolkit.
4. Wrap – Up.

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### Web Services [CONCEPT, CODE & DESIGN]

1. Introduction.
2. WCF Services basics.
3. Simple Object Access Protocol (SOAP).
4. Representational State Transfer (REST).
5. JavaScript Object Notation (JSON).
6. Creating Web Service.
  - a. WCF Class Library.
  - b. WCF Application.
7. Consuming the web service.
8. Publishing the web service.
9. Hosting the web service.
10. Case Study: Airline Reservation Web Service.
  - a. Database Access.
  - b. Invoking web service.
11. Wrap – Up.

### Note:

1. The above syllabus will be covered in 4 months.
2. The above syllabus contains different modules as follows:
  - a. Basic C# Language for Code.
  - b. Desktop Application Development.
  - c. Web Site Designing.
  - d. Web Application Development.
  - e. Project Management.
3. The topics will be covered practically. So lab is a must or at least a projector is a must.
4. Per lecture will be of minimum 1 hr 30 min.
5. Each student should be briefed with syllabus before the batch is started

Our company strongly believes in a saying “**Bring your ideas in and entertain them royally for one of them may be your king**”.

So, we will appreciate your ideas for any changes in the syllabus or in the modules that you think is better for the student and the organization.

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