CS401T and CS401P: GUI Programming Using VB.NET

Objective:

Visual Basic.NET is the latest version of Visual Basic, the most significant evolutionary change yet in the language. At its heart is the totally new .NET framework, a rich and powerful set of classes that provides support for just about any imaginable area of programming – desktop, Internet, database, and so on. The intent of this course is to teach:

- The language Visual Basic,
- The .NET framework,
- Programming logic,
- Database programming, and
- Web application.

Outline of the Course

Minimum Class Hours			Exam time (Hours)		Marks				
					Theory		Practical		
Theory	Practical	Total	Theory	Practical	External	Internal	External	Internal	Total
60	40	100	2	3	45	15	30	10	100

Units	Topic	Minimum Class Hours			Marks (Theory)
		Theory	Practical	Total	
I	Introduction to .NET Framework & Language Fundamental	14	10	24	08
II	Library Functions	10	6	16	07
III	User-Defined Data Types, Procedures & Exception Handling	12	8	20	10
IV	Object Oriented Programming	12	8	20	10
V	Database and Web Programming	12	8	20	10
	TOTAL	**60**	**40**	**100**	**45**

Detailed Syllabus

Unit I: Introduction to .NET Framework & Language Fundamentals **14+10 Hours**

Getting Started : Introduction to .NET Framework, Types of VB.NET projects ; IDE Components- IDE Menu, Toolbox window, Solution Explorer, Properties Window, Output window, Command window, Tasklist window ; Common Properties of Controls – Name, Font, Enabled, Size, Tag, Text, TabStop, TabIndex ; Common Events – Click, DoubleClick, Enter, Leave, MouseEnter, MouseLeave;
Common Methods- Focus, Clear, Hide, Show, Scale; Building a Console application

Language Fundamentals: Comments, Variables – Declaring variables, Types of variables, Data type identifiers, Strict and Explicit options, Object variables, Converting variable types, widening and narrowing, User-defined data types, Examining variable types, Scope and lifetime of a variable; Constants;
Flow control statements – Test Structures – If...Then, If...Then...Else, Select Case, Loop structures – For...Next, Do...Loop, While...End While; Nested Control structures; Exit statement

Working with Forms: The Appearance - Properties of form Controls, Placing Control on the Forms, Setting the Tab Order, Anchoring and Docking.
The Form's Events; Loading and Showing Forms - The Startup Form, Controlling one form within another, Forms versus Dialog Boxes;

Basic Windows Controls - Label, TextBox, CheckBox, RadioButton, ListBox, CheckedListBox, ComboBox, GroupBox, TabContol, Timer, StatusBar, PictureBox, HScrollBar and VScrollBar;

Unit II: Library Functions: **10+6 Hours**

Library Functions:
Char Class – Properties : MaxValue, MinValue; Methods – IsDigit(), IsControl(), IsLetter(), IsLetterOrDigit(), IsLower(), IsUpper(), IsNumber(), IsWhiteSpace(), ToLower(), ToUpper(), ToString();

String Class – Properties : Length,Chars; Methods - Compare(), Concat(), Copy(), EndsWith(), StartsWith(), IndexOf(), LastIndexOf(), Insert(), PadLeft(), PadRight(), Remove(), Replace(),SubString(), ToLower(), ToUpper(), Trim(), TrimEnd(), TrimStart()

Math Class – Methods : Abs(), Ceiling(), Floor(), Log(), Max(), Min(), Pow(), Round(), Sign();

DateTime Class – Properties : Date, DayOfWeek, DayOfYear, Hour, Minute, Second, Day, Month, Year, TimeOfDay; Methods : Compare(), DaysInMonth(), IsLeapYear(), Add(), Subtract(), AddDays(), AddHours(), AddMinutes(), AddMonths(), AddSeconds(), AddYears(), Today(), ToLongDateString(), ToLongTimeString(), ToShortDateString(), ToShortTimeString(), ToString();

Unit III: User-Defined Data Types, Procedures & Exception Handling **12+8 Hours**
Arrays, Structures and Enumerations: Arrays-Declaring and Initializing arrays, array limits, multi-dimensional arrays, dynamic arrays, Jagged arrays; Introduction to Structures and Enumerations

Procedures : Modular coding- Subroutines, Functions, Calling Functions and Subroutines; Arguments- Argument-passing mechanisms, Event-handler arguments, Passing an unknown no. of arguments, Named arguments, more types of function return values, overloading functions; Recursive functions;

Exception Handling: Types of Errors-Design-time, Runtime and Logic errors; Try...Catch...Finally statement

Unit IV: Object Oriented Programming: **12+8 Hours**
Object Oriented Programming: OOP Fundamentals – Class and objects, Creating Classes, Namespaces , Creating Property procedures, Class Methods, Class Constructors, Shared Methods, Shared Variables, Firing Events, Class Access Options, Inheritance, Polymorphism, Parent Class keywords, Derived class keywords, Parent class member keywords, Derived class member keyword, MyBase and MyClass

Unit V: Database and Web Programming: **12+8 Hours**
MDI Applications: MDI Applications Basics-Building an MDI application, Creating and accessing Child Forms, Ending an MDI application

ADO.NET: ADO.NET architecture, Creating a Dataset, DataGrid control, Data Binding, BindingContext object, Binding complex controls, DataAdapter object, Command object, DataReader object,

ASP.NET : Building a web application, maintaining state, web controls, validation controls, ASP.NET objects – Page object, Response object, Request object, Server object; Handling multiple forms in Web applications;

Database Access in Web Applications: Data-Bound Web controls – DropDownList, DataList, DataGrid, Repeater; Simple Data binding, Binding to DataSets;

Introduction to Web Services

Instruction to Paper Setter

The question papers will be set according to the following scheme.

Theory Questions				Practical Questions		
Unit	**To be set**	**To be answered**	**Marks**	**To be set**	**To be answered**	**Marks**
I	2	1	08	2	1	10
II	2	1	07			
III	2	1	10	2	1	10
IV	2	1	10			
V	2	1	10	2	1	10
Total	**10**	**5**	**45**	**6**	**3**	**30**

Recommended Books
Text:

1. **Petroutsos, E.,** *Mastering Visual Basic.NET,* New Delhi: BPB Publications, 2004
2. **Bill Evjen, Jason Beres ,et.al Visual Basic.Net** programming Bible, Wiley India Pvt. Ltd.

Reference:

1. **Murach's,** *Beginning Visual Basic.NET, Anne Prince,* Tech Publications PTE Ltd, Singapore, 2002
2. **Jeffrey R Shapiro,** *Complete Reference Visual Basic.NET*
3. **Riordan,** *Microsoft ADO.NET Step By Step,* New Delhi: Prentice-Hall India, 2004
4. **Halvorson,** *Microsoft Visual Basic.NET Step by Step,* New Delhi: Prentice-Hall India, 2004
5. **Duthie,** *Microsoft ASP.NET Step By Step,* New Delhi: Prentice-Hall India, 2004