ITT Technical Institute

CS331

.NET Framework Programming

Onsite Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 50 (30 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: CS320 Programming in C# or equivalent

Course Description:

This course covers advanced Windows programming topics using both Visual Basic and C#. Topics include various .NET Framework libraries, data structures, multithreading, globalization, and custom controls.

Syllabus: .NET Framework Programming

Instructor:	_____
Office hours:	_____
Class hours:	_____

Major Instructional Areas

1. Common Language Runtime (CLR) and Common Type System (CTS)
2. .NET Assemblies
3. Configuration Files
4. .NET Framework Namespaces
5. Globalization
6. Graphic User Interface (GUI) Programming
7. Custom Controls
8. Multithreading
9. Deployment
10. Data Structures
11. Searching and Sorting
12. Security
13. Component Object Model (COM) Interoperability

Course Objectives

1. Explain the purpose of the Common Language Runtime (CRL) and the Common Type System (CTS).
2. Describe how a .NET application is compiled and executed.
3. Write code that interoperates with Component Object Model (COM) components and applications.
4. Use configuration files to customize your application.
5. Create an application that uses the functionality in various .NET Framework namespaces.
6. Implement globalization and localization features.
7. Create an application that uses the System.Security namespace.
8. Create an application that uses Graphics Device Interface (GDI+) and other advanced user interface techniques.
9. Create custom controls.
10. Create a multithreaded application.
11. Create a deployment package for a Windows application.
12. Use generics, collections, and data structures to process data.
13. Implement searching and sorting.

Course Outline

Note: All graded activities, except the Course Project and the exams, are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Lab 2.1 refers to the first lab activity in Unit 2.

Unit	Activities

1—
.NET Framework Introduction
	• Content Covered:
	  .NET Framework Programming:
	    o Chapter 1, "Introducing .NET"
	    o Chapter 2, "Common Language Runtime"
	• Labs: 1.1

Unit	Activities
	• Assignments: 1.1

2—
Languages and Class Libraries
	• Read from *.NET Framework Programming*:
	   ○ Chapter 3, ".NET Languages"
	   ○ Chapter 4, "Surveying the .NET Framework Class Library"
	• Labs: 2.1
	• Assignments: 2.1
	• Course Project: Part 1

3—
Graphical User Interface Concepts
	• Read from *.NET Framework Programming*:
	   ○ Chapter 5, "Building Windows Forms Applications"
	   ○ Chapter 6, "Windows Forms Controls"
	• Labs: 3.1
	• Assignments: 3.1
	• Course Project: Part 2

4— Advanced Graphics	• Read from *.NET Framework Programming*: ○ Chapter 7, "Graphics and Multimedia," pp. 812-853 • Labs: 4.1 • Assignments: 4.1 • Course Project: Part 3 • Quizzes: 4.1

5—
Searching and Sorting
	• Read from *.NET Framework Programming*:
	   ○ Chapter 14, "Searching and Sorting"
	   ○ Chapter 15, "Data Structures"
	• Labs: 5.1
	• Assignments: 5.1
	• Course Project: Part 4

6— Multithreading	• Read from *.NET Framework Programming*: ○ Chapter 13, "Asynchronous Programming and Multithreading" • Labs: 6.1 • Assignments: 6.1 • Course Project: Part 5 • Exam I
7— Data Structures	• Read from *.NET Framework Programming*: ○ Chapter 15, "Data Structures" • Labs: 7.1 • Assignments: 7.1 • Course Project: Part 6

8—
Generics and Collections
	• Read from *.NET Framework Programming*:
	   ○ Chapter 16, "Generics"
	   ○ Chapter 17, "Collections"
	• Labs: 8.1
	• Assignments: 8.1
	• Course Project: Part 7
	• Quizzes: 8.1

9—
Globalization and Localization
	• Read from *.NET Framework Programming*:
	   ○ Chapter 8, "A Roadmap for the Internationalization Process"
	   ○ Chapter 9, "Unicode, Windows, and the .NET Framework"
	   ○ Chapter 10, "An Introduction to Internationalization"
	   ○ Chapter 11, "Windows Forms Specifics"
	   ○ Chapter 12, "Globalization"
	• Labs: 9.1
	• Assignments: 9.1
	• Course Project: Part 8

Unit	Activities
10— Security and Deployment	• Read from *.NET Framework Programming*: ○ Chapter 18, "Code Refinement, Security, and Deployment" • Labs: 10.1 • Assignments: 10.1 • Course Project: Part 9
11— Course Review and Exam	• Review • Exam II • Course Project: Part 10

Instructional Methods

This curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools.

This course is designed to cover the .NET Framework architecture and discuss how to implement advanced features using .NET Framework, Visual Basic, and C#. To succeed in the course, you must be comfortable programming in both C# and Visual Basic. Although many of the examples in the textbook are given in C#, you are expected to be able to write code using the libraries in both Visual Basic and C#. Differences between the languages will be pointed out during lecture and you are encouraged to use MSDN and ITT Tech Virtual Library references if you have additional questions.

Some activities are structured to allow you to create a design or program flow and critique other students' designs and program flows. These critiques are important to help you learn how to give and receive constructive criticism.

Hands-on practice is an essential part of learning any programming language. This course includes labs that you will complete individually. The labs require you to think about the code you are writing and answer questions about how it works. You will be asked to complete some labs using Visual Basic and others using C#.

Writing assignments give you a chance to explain concepts and work on your writing skills. You will also have the opportunity to prepare and deliver PowerPoint presentations about various .NET Framework programming issues.

The course project allows students to work in teams. You will build an application that uses many of the libraries discussed in the course and prepare that application for deployment.

Instructional Materials and References

Student Textbook

Chappell, D., Smith-Ferrier, G., Perry, S. C., & Deitel, P. (2009). *.NET framework programming* (Custom ed.). Boston, MA: Pearson Custom

Other Required Resources

In addition to the student textbook package, the following is also required in this course:
• Internet access

Equipment and Tools

• ITT-Lab virtual machine

- Microsoft Office (on host machine of lab computer)
- Microsoft Visio (on host machine of lab computer)
- Windows XP Professional Service Pack 2 (on virtual machine)

References

ITT Tech Virtual Library

Log on to the ITT Tech Virtual Library at http://www.library.itt-tech.edu/ to access online books, journals, and other reference resources selected to support ITT Tech curricula.

Books

You may click "Books" or use the "Search" function on the home page to find the following books.
- ITT Tech Virtual Library> Main Menu> Books> Books 24x7
  - Duffy, Joe. *Professional .NET Framework 2.0*. Indianapolis, IN: Wiley Publishing, Inc., 2006.
  - Golding, Tod. *Professional .NET 2.0 Generics*. Indianapolis, IN: John Wiley & Sons, Inc., 2005.
  - Johnson, Bruce, Mike Snell, and Shawn Wildermuth. *MCPD Self-Paced Training Kit (Exam 70-548): Designing and Developing Windows-Based Applications Using the Microsoft .NET Framework*. Redmond, WA: Microsoft Press, 2007.
  - MacDonald, Matthew. *Pro .NET 2.0 Windows Forms and Custom Controls in C#*. Berkeley, CA: Apress, 2006.
  - MacDonald, Matthew. *The Book of Visual Basic 2005—.NET Insight for Classic VB Developers*. San Francisco: No Starch Press, 2006.
  - Northrup, Tony. *MCAD/MCSD Self-Paced Training Kit: Implementing Security for Applications with Microsoft Visual Basic .NET and Microsoft Visual C# .NET (70-330 and 70-340)*. Redmond, WA: Microsoft Press, 2005.
  - Troelsen, Andrew. *Pro C# 2005 and the .Net 2.0 Platform*. 3rd ed. Berkeley, CA: Apress, 2005.
  - Troelsen, Andrew. *Pro VB 2005 and the .Net 2.0 Platform*. 2nd ed. Berkeley, CA: Apress, 2006.
  - White, Eric. *Pro .NET 2.0 Graphics Programming*. Berkeley, CA: Apress, 2005.
- ITT Tech Virtual Library> Main Menu> Books> NetLibrary
  - Gunnerson, Eric, Nick Wienholt, and Anders Hejlsberg. *A Programmer's Introduction to C# 2.0*. 3rd ed. Berkeley, CA: Apress, 2005.
  - McMillan, Michael. *Data Structures and Algorithms Using Visual Basic.NET*. New York: Cambridge University Press, 2005.

Reference Resources

You may click "Reference Resources" or use the "Search" function on the home page to find the following reference resources.

- DevX
- Free Online Dictionary of Computing
- Webopedia

Learning Guides

You may click "Learning Guides" or use the "Search" function on the home page to find the following learning guides.

- ITT Tech Virtual Library> Main Menu> Learning Guides>
  - Computer Science Tutorials
  - Computer Technical Tutorials
  - Edumax

        o   Programming Tutorials

Other References

The following resources may be found **outside** of the ITT Tech Virtual Library, whether online or in hard copy.

<u>Websites</u>

- Microsoft Developer Network (MSDN)

http://msdn2.microsoft.com/en-us/default.aspx
This vendor site is a portal to information about developer tools and programming languages.

All links to Web references outside of the ITT Tech Virtual Library are always subject to change without prior notice.

Course Evaluation and Grading

Evaluation Criteria Table

The final grades will be based on the following categories:

CATEGORY	WEIGHT
Assignments	10%
Labs	25%
Course Project	15%
Quizzes	10%
Exam I	20%
Exam II	20%
Total	**100%**

Note: Students are responsible for abiding by the Plagiarism Policy.

Grade Conversion Table

The final grades will be calculated from the percentages earned in the course, as follows:

A	90–100%	4.0
B+	85–89%	3.5
B	80–84%	3.0
C+	75–79%	2.5
C	70–74%	2.0
D+	65–69%	1.5
D	60–64%	1.0
F	<60%	0.0