

IT-2680: VISUAL C# .NET

Cuyahoga Community College

Viewing: IT-2680 : Visual C# .NET

Board of Trustees:

2015-05-28

Academic Term:

Fall 2018

Subject Code

IT - Information Technology

Course Number:

2680

Title:

Visual C# .NET

Catalog Description:

An introduction to object-oriented programming using the Visual C# .NET programming language. Design, code and debug Visual C# .NET applications and objects. Topics include, but not limited to, using methods, creating and using classes, GUI components, the Visual Studio IDE, event handling, using controls and exception handling.

Credit Hour(s):

4

Lecture Hour(s):

3

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

IT-1050 Programming Logic.

Outcomes

Course Outcome(s):

Design, code and debug Visual C# .NET applications and objects.

Objective(s):

1. Demonstrate the ability to design and create functioning graphical user interfaces, including use of multiple forms and a variety of .NET framework controls.
2. Design and implement event driven applications.

Course Outcome(s):

B. Create and use GUI components within the Visual Studio IDE.

Objective(s):

1. 2. Use debugging and exception handling to validate .NET applications.
 2. 4. Create and use classes with standard software development practices.
 3. 5. Practice efficient use of the Visual Studio IDE.
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Methods of Evaluation:

1. Tests / quizzes
2. Projects
3. Labs
4. Assignments
5. Team work / group projects

Course Content Outline:

1. The Visual Studio IDE
 - a. The object browser
 - b. Properties
 - c. Creating and using objects
2. Encapsulation
 - a. C# Class Type
 - b. Constructors
 - c. This Keyword
 - d. Chaining Constructor Calls Using this
 - e. Static Keyword
 - f. Defining Pillars of OOP (Encapsulation, Inheritance, Polymorphism)
 - g. C# Access Modifiers
 - h. Automatic properties
 - i. Object initialization
 - j. Constant field data
 - k. Partial Types
3. Inheritance and Polymorphism
 - a. Inheritance basics: parent class of existing class, multiple base classes, sealed keyword
 - b. Visual Studio class diagrams
 - c. Inheritance
 - i. Controlling base class creation
 - ii. Protected keyword
 - iii. Adding a sealed class
 - d. Understanding nested type definitions
 - e. C#'s Polymorphic Support
 - i. Virtual and override keywords
 - ii. Using the Visual Studio IDE to override virtual members
 - iii. Sealing virtual members
 - iv. Abstract classes
 - v. The Polymorphic Interface
 - vi. Member Shadowing
 - f. Base Class/Derived Class Casting Rules
 - g. Master Parent Class: System Object
4. Structured Exception handling
 - a. .NET and exception handling
 - b. Throwing, catching and handling exceptions
 - c. Configuring the state of an exception
 - d. System level exceptions
 - e. Application level exceptions
 - f. Processing multiple exceptions
5. Working with interfaces
 - a. Interface types
 - b. Custom interfaces
 - c. Implementing an interface
 - d. Interfaces as parameters and return values
 - e. Designing interface hierarchies
 - f. ICloneable interface
 - g. IComparable interface
6. Collections and Generics

- a. Working with System.Collections.Generic Namespace
- b. Creating custom Generic Methods
- c. Creating Custom Generic Structures and Classes
- d. Constraining Type Parameters
- 7. Delegates, Events, and Lambda expressions
 - a. .NET Delegate Type
 - b. Generic Delegates
 - c. C# Events
 - d. C# Anonymous methods
 - e. Lambda expressions
- 8. Indexer Methods
- 9. Operator Overloading
- 10. Custom Type Conversions
- 11. Extension methods
- 12. Anonymous and Pointer Types
- 13. LINQ
- 14. Object Lifetime
- 15. Building and configuring class libraries
- 16. .NET assemblies
 - a. Custom class library
 - b. Private assemblies
 - c. Shared assemblies
- 17. Type reflection, late binding, and attribute-based programming
- 18. Processes, AppDomains, and object contexts
- 19. CIL and dynamic assemblies

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Resources

Skeet, J. *C# in Depth*. 3rd ed. Manning Publications, 2013.

Clark, Dan. *Beginning C# Object-Oriented Programming*. 2013. Berkeley, CA: Apress, 2013.

Sharp, John. *Microsoft Visual C# 2013 Step by Step*. 1st ed. Microsoft Press, 2013.

Troelsen, Andrew. *Pro C# 5.0 and the .NET 4.5 Framework*. 6th. Apress, 2012.

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