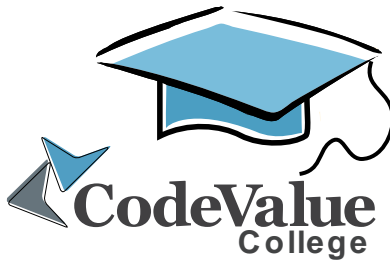


## Advanced .NET with C#

<b>Duration:</b>	40 Hours
<b>Target Audience:</b>	Experienced C# developers who want to upgrade their skills and deepen their understanding of the C# language and the .NET platform.
<b>Objectives:</b>	<ul style="list-style-type: none"><li>Understand reflection and its uses</li><li>Understand and use generic types effectively</li><li>Manage memory and non-memory resources effectively</li><li>Understand and use delegates and events</li><li>Understand what are AppDomains and how to use them</li><li>Build effective multithreading applications</li><li>Use the Task Parallel Library effectively</li><li>Use thread synchronization primitives effectively</li><li>Understand and use the C# 5.0 async programming model</li><li>Understand the LINQ family of technologies and how to use it</li></ul>
<b>Pre Requisites:</b>	Basic C# knowledge is a must. At least 6 months of .NET development is required.



## The Advanced .NET C#

### Reflection

- ◀ Reference types vs. value types
- ◀ Reflection basics and the Type class
- ◀ Creating instances dynamically
- ◀ Getting and setting data using reflection
- ◀ Creating and using Custom Attributes

### Generics

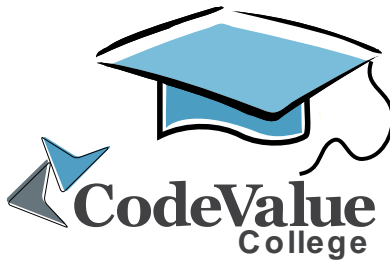
- ◀ The need for generics
- ◀ Writing and using generic types
- ◀ Generic methods & interfaces
- ◀ Generic collections
- ◀ Generic interfaces
- ◀ Generic constraints
- ◀ Generic variance and contravariance
- ◀ Other aspects of generic programming
- ◀ Nullable types

### Advanced Delegates and Events

- ◀ Working with delegates
- ◀ Creating your own delegate types
- ◀ Generic delegates
- ◀ Dynamic delegates
- ◀ Anonymous delegates
- ◀ Lambda expressions
- ◀ Events

### C# 3.0 & LINQ

- ◀ Partial types and partial methods
- ◀ Iterators
- ◀ Expression Trees
- ◀ C# 3.0 basic features
- ◀ Extension methods
- ◀ LINQ to Objects
- ◀ LINQ Operators



- ◀ Introduction to LINQ to Entity Framework
- ◀ LINQ to XML

### **Managing Resources**

- ◀ Garbage collection and its impacts
- ◀ Generations
- ◀ Finalizers
- ◀ The Dispose pattern
- ◀ GC Handles
- ◀ Weak references
- ◀ The Large object heap
- ◀ GC types
- ◀ GC Best Practices
- ◀ Looking at memory

### **Processes, AppDomains and Threads**

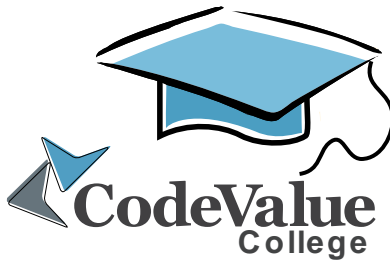
- ◀ Processes
- ◀ Virtual Memory
- ◀ Application Domains vs. processes
- ◀ Threads and AppDomains
- ◀ AppDomains and objects
- ◀ Crossing AppDomains
- ◀ Marshalling and serialization

### **Multithreading**

- ◀ Managed vs. Unmanaged threads
- ◀ Thread scheduling
- ◀ Creating and managing threads
- ◀ The Thread class
- ◀ Thread Local Storage (TLS)
- ◀ Thread synchronization
- ◀ Synchronization kernel objects
- ◀ The Thread Pool
- ◀ Multithreading best practices

### **Tasks**

- ◀ Introduction to Tasks



- ◀ Creating tasks
- ◀ Cancelling tasks
- ◀ Tasks & Exceptions
- ◀ Task schedulers
- ◀ The Parallel class
- ◀ Parallel LINQ
- ◀ Concurrent Collections

#### **C# 4.0 & C# 5.0**

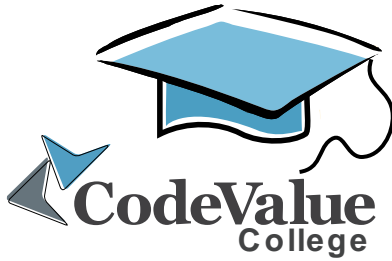
- ◀ Introduction
- ◀ Optional and Named Arguments
- ◀ Dynamic typing
- ◀ Improved COM interop
- ◀ Caller member info in C# 5.0
- ◀ Asynchronous patterns in .NET
- ◀ Asynchronous Programming with C# 5.0
- ◀ C# 5.0 Best Practices

#### **Appendix A: Serialization (if time permits)**

- ◀ Serialization Scenarios
- ◀ Serialization Attributes
- ◀ Object Graph
- ◀ Serialization Process
- ◀ Deserialization Example
- ◀ Custom Serialization
- ◀ Other serializers

#### **Appendix B: Interoperability (if time permits)**

- ◀ Interoperability scenarios
- ◀ Platform Invoke (P/Invoke)
- ◀ Marshalling parameters and types
- ◀ Using COM Components
- ◀ COM Apartments and AppDomains
- ◀ Best practices



## Course Compatibility Questionnaire

Please answer the following questions as accurately as possible:

Name: \_\_\_\_\_ Email: \_\_\_\_\_  
Company: \_\_\_\_\_ Phone: \_\_\_\_\_

Language / Technology / Platform	Years of Experience						Level of Familiarity				
C++	0-1	1-2	2-3	3-4	4-5	5+	1	2	3	4	5
C#	0-1	1-2	2-3	3-4	4-5	5+	1	2	3	4	5
Visual Studio Debugger	0-1	1-2	2-3	3-4	4-5	5+	1	2	3	4	5
SysInternals tools	0-1	1-2	2-3	3-4	4-5	5+	1	2	3	4	5
Other _____	0-1	1-2	2-3	3-4	4-5	5+	1	2	3	4	5

What is the operating system that as a user you mostly use?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What are your expectations from the course?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Thanks!

<http://college.codevalue.net/>