

Programming 741 (C#)

1. Overview

This programme prepares participants to develop object-oriented applications using the C# programming language and .NET framework. Participants explore C# language fundamentals, methods and scope, object-oriented programming concepts, inheritance and polymorphism, collections and data structures, exception handling, and event-driven programming using delegates and events. The module develops practical skills for C# developers and software engineers, creating Windows applications and .NET solutions.

2. Learning Outcome:

- Apply C# language fundamentals, including types, variables, operators, and expressions, implement constants and enumerations for data management, manipulate strings for text processing, apply control structures for program flow, implement iteration statements for repetitive operations, and use various operators for computations and comparisons
- Create and declare methods with appropriate signatures, implement methods that return data using value-returning and void methods, call class methods and predefined methods, utilise methods in the Math class for mathematical operations, and write custom class methods for code reusability
- Apply classification principles for organising code, implement encapsulation to protect data integrity, define and use classes as blueprints for objects, create properties for controlled access to class members, implement static members for class-level functionality, define structs for value types, and create anonymous classes for temporary data structures
- Implement inheritance for code reusability and hierarchical relationships, apply polymorphism and method overriding for flexible program design, create abstract classes for defining common interfaces, implement sealed classes to prevent inheritance, and define and implement interfaces for contract-based programming
- Declare and manipulate arrays for storing collections of data, understand default values for array elements, implement multidimensional and rectangular arrays for complex data structures, create indexers for custom collection access, implement ArrayLists for dynamic collections, utilise queues for First-In-First-Out operations, and implement stacks for Last-In-First-Out data management
- Implement exception handling using throwing and catching mechanisms, work with exception objects for error information, and apply exception rethrowing techniques for proper error propagation
- Create and use delegates for method references and callback functionality and implement events for event-driven programming patterns

Qualification:	Certificate of Competence
Duration:	4-Months
Programme Type:	Category B – Workplace-Based Learning Programme
Programme ID:	PA0872
NQF Level:	7
Credits:	15
Contact Days:	Three (3) facilitated online workshops (recordings available)
Prerequisites:	Grade 12 Qualification or NQF Level 4 equivalent
Training Options:	Online Learning: Please contact our Sales team to confirm the next available intake date for this programme.
Minimum Learner Required:	(1) Online

3. Topics

- Introduction to C# and the .NET Framework
- C# Program Structure and Syntax
- Variables, Data Types, Constants, and Enumerations
- Operators and Expressions
- String Manipulation
- Decision-Making and Control Structures
- Iteration Statements (Loops)
- Methods and Functions
- Method Parameters and Return Types
- Using Built-in Methods and the Math Class
- Classes and Objects
- Encapsulation
- Properties and Access Modifiers
- Static Members
- Structures (Structs)
- Anonymous Types
- Inheritance
- Polymorphism
- Method Overriding
- Abstract Classes
- Sealed Classes
- Interfaces
- Arrays and Multidimensional Arrays
- ArrayLists and Collections
- Queues and Stacks
- Indexers
- Exception Handling
- Throwing, Catching, and Rethrowing Exceptions

We trust that the above is in order and look forward to hearing from you for Implementation

- Delegates
- Events and Event-Driven Programming
- Windows Application Development with .NET
- C# Programming Best Practices
- Practical C# and .NET Application Development

4. Workplace-Based Learning Programme

This WLP is a fusion of academic learning and practical work. The learning is directly applied to the workplace by using client-based mentors and extensive workplace-based portfolio work and assignments. Apart from the obvious benefits of a workplace directed qualification, each WLP qualifies for recognition as a Category B Skills Programme in the Learning Matrix of the Amended BEE codes, which allows for the salaries of participants to be recognized as part of the Skills Development Expenditure.

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