**Analytical Government Solutions**

**(AGS LLC)**

**5714 River Dr, Mason Neck, VA 22079**

**C++ Basic Course (5 Days)**

**Summary Statement:**

C++ is a cross platform programing language that builds on C. This general- purpose, object-oriented program language allows programmers to reuse existing components and design new components to speed up the creation of new applications. C++ programming allows the programmer to reuse existing components and design new components to speed up the creation of new applications. C++ combines the features of object-oriented programming with a syntax based upon C.

**Learning Objectives:**

This hands-on course allows participants to learn the basics of this object-oriented way of program design including syntax and grammar. Students will:

* Learn basic syntax, integer types, loops, and arrays
* Learn subroutines and reusable block of code
* Understand Object Oriented Coding
* Learn pointers and memory
* Understand inheritance and encapsulation
* Understand static variables
* Participate in a final class exercise

**Intended Audience:**

This course is intended for participants who are computer literate and familiar with downloading and unzipping files, using the Internet and so on, and who want to learn to program.

**Course Agenda:**

DAY 1

1. **Introduction to C++**

Getting started and why learn C++

1. **Basic Syntax:**

* Variables
* Strings
* User Input
* Binary Numbers and Computer Memory
* Integer Types
* Floating Point Types
* The Types: Char and Bool
* If
* If-Else
* If-Else If-Else
* Comparing Floats
* C++ Conditions
* While Loops
* Do-While Loops
* “For” Loops
* Break and Continue
* Arrays - Lists of Data
* Multidimensional Arrays
* Size of and Arrays
* Size of Multidimensional Arrays
* Switch

DAY 2

1. **Subroutines: Reusable Blocks of Code:**

* Functions
* Return Values
* Function Parameters
* Headers and Prototypes

1. **Object-Oriented Coding:**

* Classes
* Data Members
* C++ Constructors and Destructors
* C++ Getters and Setters
* C++ String Streams
* Overloading Constructors
* The "this" Keyword
* Constructor Initialization Lists

DAY 3

1. **Pointers and Memory:**

* Pointers
* Arithmetic
* Pointers and Arrays
* Pointer Arithmetic
* Char Arrays
* Reversing a String
* References
* The "const" Keyword
* Copy Constructors
* The New Operator
* Returning Objects from Functions
* Allocating Memory
* Arrays and Functions
* Namespaces

1. **Inheritance:**

* Inheritance
* Encapsulation
* Constructor Inheritance

DAY 4

1. **Odds and Ends: Twos Complement and Static Variables:**

* Twos Complement
* Static Keyword

DAY 5

1. **Developing a Program:**

Class exercise

# **Methods of Presentation**

The course is a mixture of:

* In-Person Lecture
* Visual Presentation
* Knowledge Checks
* Course Workbook
* Lab/ Live Demonstration
* A laptop will be required for this course

Respectfully,



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