**Course syllabus**

**C++ Essentials 1 (CPPE1)**

**Module 0: Installing And Using Your Programming Environment**

* Introduction to IDE;
* Online tools;
* Edube Interactive.

**CPPE1 - Module 1: Absolute Basics - Introduction to Computer Programming**

* languages: natural and artificial;
* machine languages;
* high-level programming languages,
* obtaining the machine code: compilation process;
* variables;
* integer values in real life and in C++;
* integer literals;
* characters;
* comments;
* the basics of flow control;
* dealing with streams and basic I/O operations;
* writing simple programs.

**CPPE1 - Module 2: Advanced flow control and data aggregates**

* how to control the flow of the program;
* more data types;
* conditional instructions: if, else, switch;
* loops and controlling the loop execution;
* logic, bitwise and arithmetic operators;
* vectors, multidimensional arrays;
* declaring and initializing structures.

**CPPE1 - Module 3: Extending expressive power: pointers, functions, and memory**

* designing, declaring, and invoking functions;
* pointers;
* different methods of passing parameters and their purpose;
* default parameters;
* inline functions;
* overloaded functions;
* sorting;
* memory on demand.

**CPPE1 - Module 4: Accessing various data types**

* arrays of pointers;
* conversions;
* strings: declarations, initializations, assignments;
* strings as an example of objects: (methods and properties)
* using and declaring namespaces;
* dealing with exceptions.

**CPPE1 - End of Part 1**

* CPPE1: Part 1 Summary Test (Score 70% or more to unlock Part 2.)

**C++ Essentials 2 (CPPE2)**

**CPPE2 - Module 1: The essentials of Object-Oriented Programming**

* Basic concepts of OOP;
* A stack: the procedural approach vs. the OOP approach;
* The anatomy of the class;
* Static components;
* Objects vs. pointers and objects inside objects.

**CPPE2 - Module 2: Inheritance**

* Class hierarchies;
* Classes, inheritance, and type compatibility;
* Polymorphism and virtual methods;
* Objects as parameters, and dynamic casting;
* Various supplements;
* The *const* keyword;
* Friendship in the C++ world.

**CPPE2 - Module 3: Exceptions**

* Introduction to exceptions;
* The *throw* statement;
* Categorizing exceptions;
* Catching exceptions;
* Exceptions in action.

**CPPE2 - Module 4: Operators and enumerated types**

* Overloading operators;
* Enumerated types.

**CPPE2 - End of Part 2**

* CPPE2: Part 2 Summary Test (Score 70% or more to unlock the Final Test)
* C++ Essentials - Final Test (Score 70% or more to be eligible for the CPA exam discount code.)