

Intro to Programming with C++ – PROGRAM

1. Introduction to Programming

- What is computer programming?
- My first C++ program
- Using MS Visual Studio. Compiling, running and debugging programs

2. Primitive data types. Variables

- Integer types
- Floating-point types
- Boolean type
- Char
- String
- Variables. Using variables
- Literals

3. Operators. Expressions

- Arithmetic operators
- Comparison operators
- Other operators
- Implicit and Explicit Type Conversion
- Expressions

4. Using console

- Printing to the console
- Reading from the console

5. Conditional statements

- *if* and *if-else* statements
- Nested *if* statements
- *switch-case* statement

6. Loops

- *while* loops
- *do ... while* loops
- *for* loops
- Nested loops

7. Pointers and Arrays

- Declaring and creating arrays
- Accessing array elements
- Inputting and outputting arrays
- Processing arrays with *for* loops

- **Multidimensional arrays**

8. Methods

- **Declaring methods**
- **Calling methods**
- **Using parameters**
- **Returning values**

9. Defining classes and objects

- **Defining simple classes. Declaring fields.**
- **Using classes**
- **Constructors**

10. Strings and string manipulation

- **Basic operations with strings – comparison, concatenation, extracting substring, searching**
- **More operations with strings – replacing substrings, deleting substrings**

11. Basic data structures

- **Arrays – `std::vector` Class**
- **Stacks – `std::stack` Class**
- **Queues – `std::queue` Class**
- **Sets – `std::set` Class**
- **Maps – `std::map` Class**

12. Object-oriented programming – advanced concepts

- **Inheritance**
- **Encapsulation and abstraction**
- **Cohesion and coupling**
- **Polymorphism**

Training Duration – 40 hours