# C++ Modern Development (11/14/17) - course syllabus

**Course length:** Three daily sessions, eight hours each.

**Course goals:** C++ 11 emerged as the new C++ standard, followed by C++ 14 and 17, that enhances C++ developer productivity preserving the important properties of the language such as performance & efficiency. Modern compilers, such as gcc and Visual Studio 2017 implement most of the new features of the language and of the standard library.

In this course we will explore C++ 11/14/17 language and library enhancements, modernizing C++ coding standards and practices, in order to maximize productivity with the new language features and libraries.

The course includes lab exercises to help the material sink in.

**Target audience:** C++ developers and team leaders with At least 2 years' experience developing with C++

**Course Methodology:** Three daily sessions of about eight hours each. This is the basic daily schedule:

- 09:00-10:30 First session
- 10:30-10:45 Recess
- 10:45-12:00 Second session
- 12:00-13:00 Lunch break
- 13:00-15:00 Third Session
- 15:00-15:15 Recess
- 15:15-17:00 Fourth Session

We believe that only practical hands on experience will help fully understand the material at hand. For this reason each session includes a practical exercise where the actual hands on experience can be gained.

**As with all our courses, the content of this course can be personally tailored to your needs and requirements. Content can be removed, added or altered as needed.**

**Detailed curriculum:**

## Module 1: Introduction to Modern C++

- The C++ standards
- C++ evolution
- Introduction to STL
- Containers
- Iterators
- Algorithms
- Memory Allocators

## Module 2: Language Features (Part 1)

- Type inference
- Scoped enums
- Lambda functions
- Range-based for
- Move semantics and R-value references
- Uniform Initialization
- Compile-time assertions

## Module 3: Templates

- Quick templates review
- Macros vs. templates
- Local and unnamed types as template arguments
- Template aliases
- Template metaprogramming
- Variadic templates
- Template Arguments Class Template Deduction

## Module 4: Language Features and Libraries (Part 2)

- Resource Management
- RAII
- Smart pointers
- Explicit conversion operators
- Thread Local Storage
- Const expressions
- Structural Decomposition
- Attributes

Practis
Practical training

## Module 5: Concurrency in Modern C++

- The C++ Memory Model
- Threads
- Async operations
- Synchronization
- Promises
- Resumable functions

# Good luck!