

---

# Modern C++ C++11 / C++14 / C++17

Material based on N4659, created on March 16, 2023

The logo for KDAB, featuring a stylized white 'K' icon on a blue background.

KDAB

*The Qt, OpenGL and C++ Experts*

---

- Introduction to Modern C++
  - Further Reading
- Philosophy of Modern C++

No part of this publication may be made available to others than the named licensee which is shown on every page by any means, electronic, mechanical, photocopying, recording or otherwise, or translated into any language, without the prior written permission of the publisher.

## Important C++11/14/17 Language Changes

- Null Pointer Literal
- Uniform Initialization
- noexcept
- Move Semantics
  - High-level View: Transfer of ownership
  - Low-level View: Rvalue References and `std::move`
- Defaulted & Deleted Functions
- Miscellanea
- Explicit Virtual Overrides
- Type Inference
- Range-based for Loop
- Lambdas
- Constructors

## Important C++11/14/17 Library Additions

- Vocabulary Types
- Smart Pointers
- Containers
- Function Wrappers
- Algorithms

## Supplemental Topics

### Multithreading

- Multithreading Introduction
- Multithreading Utilities
- The C++11 Memory Model
- Atomics

### Templates and Generic Programming

- noexcept
- Type Inference
- Wrapping and Invoking Functions
- Perfect Forwarding
- Variadic Templates
- Class Template Deduction
- General Template Changes
- constexpr if
- Expression SFINAE
- Concepts and constraints

## Supplemental Topics

### Additional Language Topics

- Strongly-Typed Enums
- Constant Evaluation
- Guaranteed Copy Elision
- Structured Bindings
- The Tuple Protocol
- Attributes
- Explicit Conversion Operators
- Alignment Control
- Special User-Defined Types
- Inline Namespaces
- User-Defined Literals
- Stricter Evaluation Order
- Three-way and Default Comparisons

### Additional Standard Library Topics

- Ranges
- Allocators
- Random Numbers
- Associative Containers
- Regular Expressions
- String Processing
- Filesystem
- General Utilities Libraries
- Time and durations
- Diagnostics Libraries

## Supplemental Topics

### Other Additional Topics

- Compiler Support