



# UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Advanced topics in C++

2122-86R-ATC++

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#### Title

Advanced Topics in C++

#### Teacher(s)

Prof. Dario Menasce

#### Language

English

#### Short description

- Introduction to compiled languages
- The C++ compiler
- GNU g++
- Compilation stages
  - The tokenizer
  - The parser
  - The pre-processor
  - The compiler
  - The linker
  - The loader
- Pointers & References
- Stack and heap (memory management)
- The concept of "scope" (memory management)
- Classes
- Encapsulation
- Polymorphism
- Inheritance
- Multiple inheritance
- Friendship
- Difference between "class" and "object"
- Garbage collection (memory management)
- Ownership
- Constructors/destructors
- Explicit constructors
- Copy constructor (memory management)
- Forward declarations
- Constness
- Static variables
- Exception handling
- Casting (static, dynamic)
- Operator overloading
- The singleton pattern
- Namespace
- Generic programming
- Templating
- Standard template library (STL)
  - Vectors
  - Maps
  - Lists
  - Queues
  - Iterators
  - Algorithms
- Advanced features
- Plugins
- Qt as an example of framework with IDE and asynchronous programming
- Root

**CFU / Hours**

2 CFU, 24 hours

**Teaching period**

January - March 2022

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