



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 o The tokenizer o The parser o The pre-processor o The compiler o The linker o 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) o Vectors o Maps o Lists o Queues o Iterators o 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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