



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Advanced topics in C++

86R-XXXVI-ATC

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#### Aims

#### Contents

#### Detailed program

- 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.

## **Prerequisites**

## **Teaching form**

2 CFU, 24 hours.

## **Textbook and teaching resource**

## **Semester**

February 16, 23, 25 2021 h. 15-17;

March 2, 4, 9, 11, 16, 18, 23, 25, 30 2021 h. 15-17.

## **Assessment method**

## **Office hours**

