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# Object oriented programming in C++

## Finalità

To enable students to design solutions to computational problems in an object-oriented manner. Students will:

- learn the concepts of class, object, inheritance, and polymorphism;
- build complex data structures;
- be introduced to the development in UNIX environment.

## Programma

### \* Introduction

- UNIX programming tools
- Basic C++ concepts: variable declarations, expressions, functions, arrays, and pointers
- Dynamic memory allocation, non-OO syntax
- Introduction to object oriented programming

### \* Classes in C++

- Stream I/O in C++
- Classes and encapsulation
- Member functions, constructors, destructors
- Copy constructor, operator=
- Friendship

### \* Storage Management

- Memory allocation
- Dynamic allocation: new and delete

### \* Inheritance

- Overview of inheritance
- Defining base and derived classes
- Constructor and destructor calls

### \* Polymorphism

- Function overloading
- Operator overloading
- Virtual functions, purely virtual functions

### \* Exceptions

- Overview of exceptions
- Inheritance and exceptions
- Exception hierarchies

### \* Templates

- Template overview
- Containers and iterators
- STL containers, iterators, functors

## Attività d'esercitazione

Theoretical lessons will be integrated by hands-on experiences.

## Modalità d'esame

A quiz and a programming test. Occasionally, oral exams are also required.

## Propedeuticità

Fondamenti di Informatica A + Laboratorio di Programmazione.

## Testi consigliati

W. Savitch, Absolute C++, 2/e, Addison-Wesley