



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Geometria Complessa

2122-1-F4001Q069

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#### Aims

This course is an introduction to the geometry of complex manifolds. Some constructions will be shown (holomorphic vector bundles, Dolbeault cohomology, hermitian metrics) that parallel constructions in the context of real differentiable manifolds, with substantial differences due to the greater rigidity of holomorphic functions compared to  $C^\infty$  functions.

Students are expected to gain knowledge of fundamental notions relative to complex geometry. They are also expected to gain the ability to analyse and reproduce the proofs presented in the course, and to delve further, with or without guidance, into some of the results presented during the course.

#### Contents

Functions of several complex variables, complex manifolds, vector bundles, hermitian metrics, hermitian symmetric spaces.

#### Detailed program

- Holomorphic functions and Hermitian linear algebra.
- Complex manifolds, holomorphic vector bundles, connections.
- Dolbeault cohomology.

- Hermitian and Kähler. metrics.
- Semisimple Lie groups, hermitian symmetric spaces.

## **Prerequisites**

Vector spaces, topological spaces, differential and integral calculus, differentiable manifolds, functions of one complex variable.

## **Teaching form**

Lectures: 8 CFU

## **Textbook and teaching resource**

D. Huybrechts, Complex Geometry. An Introduction, Springer 2005

## **Semester**

II semester

## **Assessment method**

Oral examination with questions on definitions, theorem statements and proofs. Evaluation will be based on correctness, completeness and exactitude of the answers.

## **Office hours**

By appointment

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