



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Geometria I

2223-1-E3501Q004

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#### Aims

Give an elementary introduction to geometry and topology.

#### Contents

Fundamentals of point-set topology and some aspects of metric spaces will be discussed.

#### Detailed program

**Topological spaces and continuous functions.** Real numbers.. Topological spaces. Basis of a topology. Subsets of a topological space. Continuous functions and homeomorphisms.

**Examples of topological spaces.** Subspaces. Products. Quotients.

**Topological properties.** Separation axioms and Hausdorff spaces. Compactness. Connected and path-connected spaces.

**Topology in metric spaces** Main topological properties of metric spaces and completeness.

**Topological groups and group actions** Main definitions and classical examples (matrix groups, projective spaces)

## **Prerequisites**

Limits and continuity of real functions. Linear Algebra.

## **Teaching form**

Classroom lectures will be split into: theoretical sessions (discussion of relevant results of the theory, examples, and counterexamples), exercises sessions (training how to solve exercises and problems).

## **Textbook and teaching resource**

S. Francaviglia, Topologia

<https://www.amazon.it/Topologia-Seconda-Edizione-Esercizi-Esempi/dp/1658028929/>

<https://www.dm.unibo.it/~francavi/>

E. Sernesi, Geometria, vol. I-II. Bollati-Boringhieri (1989, 1994). J. Dugundji, Topology, 20ma edition, Allyn and Bacon Inc.

J. R. Munkres, Topology, 2nd edition. Prentice Hall (2000).

J. R. Munkres, Elements of algebraic topology, Addison Wesley (1984).

C. Kosniowski, Introduzione alla topologia algebrica. Zanichelli (1988).

M. Manetti, Topologia, 2a edizione. Springer-Verlag (2014).

## **Semester**

spring

## **Assessment method**

The exam is split into two parts.

**Written part -**

**Oral part -**

## **Office hours**

by appointment

## **Sustainable Development Goals**

GENDER EQUALITY

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