UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Geometry I

2021-1-E3501Q004

Aims

Give an elementary introduction to geometry and topology.

Contents

Fundamentals of point-set topology and some aspects of euclidean and projective geometry will be discussed.

Detailed program

Topological spaces and continuous functions. Metric topology. 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. Completeness and compactness in metric spaces. Connected and path-connected spaces. Locally Euclidean spaces and topological manifolds.

Euclidean and projective spaces. Geometry of euclidean and 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

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.

Preliminary test - Ten multiple-choice questions. Correct answer +3 pts, wrong answer -1 pts, no answer 0 pts. Candidates will pass the test if they score at least 15 pts.

Oral part - Answer questions on the arguments discussed during the classes or on the exercises similar to those contained in weekly exercise sheets. In order to take the oral part, candidates need to have earned at least 15 pts

in the preliminary test. Answers will be evaluated on the base of their completeness, correctness, rigor, and clarity. The final score will take into account the scores earned in the preliminary test and the written part.

Office hours

by appointment