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Introduction to Topology

Topology studies the shape and structure of objects, focusing on their most basic properties that remain unchanged under continuous transformations. Imagine stretching and twisting a rubber band, but no matter how much you change its shape, it remains a rubber band. This is similar to the idea of topology - it looks at objects and focuses on the properties that remain constant despite being distorted.

After studying the basic notions of general topology, we will focus on topological manifolds. A topological manifold is a space that locally looks like Euclidean space, but globally may have a more complicated structure. It is a generalization of the idea of a surface, such as a sphere or a torus, to higher dimensions.

This course will provide a foundation to a deeper understanding of underlying concepts of other subjects with connections to topology, such as differential geometry, analysis, algebra and mathematical physics.

Exercise: In addition to the lecture, it is recommended that students also attend the accompanying exercise course.

Prerequisites: Linear Algebra and Analysis

Literature:

John M. Lee. *Introduction to Topological Manifolds.* Second Edition. Springer (2011)