2018/2019

Topology

Code: 100106
ECTS Credits: 6

Degree	Type	Year	Semester
2500149 Mathematics	OB	3	1

Contact

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Use of languages

Principal working language: catalan (cat)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Teachers

Louis Carlier

Alex Cebrian Galan

Prerequisites

Experience shows that it is extremely important for students to be familiar the basics of logic deduction. The students needs to feel comfortable with axiomatic methods, the basic principles of logic, and the different strategies and methods of proof (deduction, counterexamples,..). The student needs to know how to negate a proposition, how to use quantifiers (there exists, for all,...) and the idea of implication (if, only if, if and only if).

The idea is to reformulate and generalize from a broader point of view several concepts which are known in the context of metric spaces, then the student should have a good background on the topology of metric spaces, specially euclidean spaces.

Objectives and Contextualisation

Several problems stated in terms of geometric objects do not depend on rigid properties like distances, angles, ... but on some continuity of the shape of those. Those are topological problems.

The main goal of the course is to understand that ia topology in a set is the right structure to understabd the notion of **continuity.**

We will through known concepts for metric spaces: open subset, closed subse, continuity and compactness. But the student should understand that this new axiomatic point of view is more general and more flexible than the iodea from metric spaces.

The concept of topological space wants to model geometric objects like surfaces in space but goes beyind and the topology became present in many areas of mathematics.

Content

1. Topological properties of metric spaces.
2. Topological spaces: axioms.
3. Neighbourhoods, interiors and closures.
4. Continous maps.
5. Subspaces.
6. Product topology.
7. Quotient topology.
8. Compact spaces.
9. Hausdorff spaces.
10. Connectedness.
11. Topological varieties.
12. The classification of compact surfaces.