MATH-323

Topology III - Homology

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Cursus	Sem.	Type
Mathematics	BA6	Opt.

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
Exam	Written
Workload	150h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Homology is one of the most important tools to study topological spaces and it plays an important role in many fields of mathematics. The aim of this course is to introduce this notion, understand its properties and learn how to compute it. There will be many examples and applications.

Content

- Simplicial and singular homology
- Exact sequences and excision
- Mayer-Vietoris sequence
- Eilenberg-Steenrod axioms
- CW complexes
- Cellular homology
- Cohomology

Keywords

Homology, cohomology, cell complexes

Learning Prerequisites

Required courses

- Metric and topological spaces
- Topology

Learning Outcomes

By the end of the course, the student must be able to:

- Define the main concepts introduced in the course
- State the theorems covered in the course and give the main ideas of their proofs
- Apply the results covered in the course to examples
- Compute the homology groups of CW complexes

- Prove easy topological facts
- Express topological arguments

Teaching methods

lectures, exercise classes

Expected student activities

Attending the course, homework assignments, participating atively in the course and the exercise

Assessment methods

Exam written

Supervision

Office hours	Yes
Assistant.e.s	Yes
Forum	Yes

Resources

Moodle Link

- https://go.epfl.ch/MATH-323