

MATH-323

Algebraic topology

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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. 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

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

Keywords

Homology, cohomology, cell complexes

Learning Prerequisites**Required courses**

- Metric and topological spaces
- Topology

Recommended courses

- Group Theory
- Rings and Modules

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
- apply excision and Mayer-Vietoris

Teaching methods

lectures, exercise classes

Expected student activities

Attending the course, doing the weekly assignments, participating actively in the exercise classes

Assessment methods

Assignments, written exam

Dans le cas de l'art. 3 al. 5 du Règlement de section, l'enseignant décide de la forme de l'examen qu'il communique aux étudiants concernés

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

Algebraic Topology », Allen Hatcher
Algebraic Topology », Tammo Tom Dieck

Ressources en bibliothèque

- [\(version électronique\)](#)
- [Algebraic Topology / Hatcher](#)
- [Algebraic Topology / Dieck](#)