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

The aim of this course is to introduce the notions of homology and cohomology of topological spaces and to learn tools to compute them.

Content

- Cell complexes and simplicial complexes
- Simplicial and singular homology
- Exact sequences and excision
- Mayer-Vietoris sequence
- Eilenberg-Steenrod axioms
- Cohomology
- Universal coefficient theorem
- Cup product
- Poincaré duality

Keywords

Homology, cohomology, cell complexes

Learning Prerequisites

Required courses

Topology

Recommended courses

Group Theory

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 simplicial complexes
- apply excision and Mayer-Vietoris

Teaching methods

ex-cathedra teaching, exercise classes

Expected student activities

Attending the course, solving 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

Resources

Bibliography

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

Ressources en bibliothèque

- Algebraic Topology / Hatcher
- Algebraic Topology / Dieck
- (version électronique)