

Titolo del corso: Combinatorial topology and group theory

Docente: Giovanni Paolini

Membro del collegio proponente:

Ore frontali di lezione: 20

Periodo di lezione: novembre/dicembre 2024

Settore/i disciplinare del corso: MAT/03

Tipologia di corso: Base

Modalità di verifica dell'apprendimento: Esame orale

Abstract del corso:

This course will cover a few combinatorial concepts and tools that can be applied in (algebraic) topology and group theory: Forman's Morse theory for cell complexes (also known as discrete Morse theory); shellability of posets, simplicial complexes, and polyhedral complexes; Garside monoids and Garside groups. In all these topics, the underlying idea is to translate topological or algebraic problems in a purely combinatorial language.

Programma del corso:

- Partially ordered sets (posets)
- Cell complexes, simplicial complexes, polyhedral complexes
- Discrete Morse theory
- Shellability of simplicial and polyhedral complexes
- Lexicographic shellability of posets
- Combinatorial Garside structures, Garside monoids, and Garside groups
- Applications to the symmetric group and the braid group