

Istituzione di Geometria Superiore 1

topologia algebrica: omologia e coomologia singolare:

Simplessi e complessi simpliciali, omologia simpliciale, omologia singolare, complessi di catene, sequenze esatte, sequenze esatte brevi di complessi di catene, lunga sequenza esatta di omologia, semplici piccoli, sequenza esatta di Mayer-Vietoris, excision, assioma di omotopia, assiomi dell' omologia singolare;

omologia delle sfere, teorema del punto fisso di Brower, grado di mappe fra sfere, Jordan curve theorem e invariance of domain, isomorfismo tra omologia singolare e omologia simpliciale, caratteristica di Eulero, numero di Lefschetz;

CW-complessi, omologia cellulare, classificazione e omologia delle superfici;

omologia con coefficienti e coomologia, funtori Tor e Ext, coefficienti universali per omologia e coomologia, dualità di Poincaré.

algebraic topology: singular homology and cohomology:

Simplices and simplicial complexes, simplicial homology, singular homology, chain complexes, exact sequences, short exact sequences of chain complexes, long exact homology sequence, small simplices, exact sequence of Mayer-Vietoris, excision, axiom of homotopy, axioms of singular homology;

homology of spheres, fixed point theorem of Brower, degree of maps between spheres, Jordan curve theorem and invariance of domain, isomorphism between singular and simplicial homology, Euler characteristic, Lefschetz number;

CW complexes, cellular homology, classification and homology of surfaces;

homology with coefficients and cohomology, functors Tor and Ext, universal coefficients for homology and cohomology, Poincaré duality.

Riferimenti (textbooks):

J. R. Munkres, Elements of Algebraic Topology. Addison-Wesley Publishing Company 1984

A. Hatcher, Algebraic Topology. Cambridge University Press 2002

(<http://www.math.cornell.edu/~hatcher/AT/ATpage.html>)