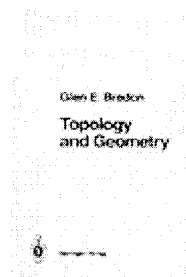


Professor Alexandru I. Suciu

MTH G221 Topology 2

Fall 2005



► Course Information

Course: MTH G221 -- Topology 2

Web site: http://www.math.neu.edu/~suciu/G221/top2_fa05.html

Instructor: Prof. Alex Suciu < a.suciu@neu.edu >

Time and Place: Tue. & Th., 7:30 - 9:00 PM, in 544 NI

Office Hours: Tue. & Th., 5:00 - 6:00 PM, or by appointment -- in 441 Lake

Prerequisites: MTH G121 Topology I

Textbook: Algebraic Topology by Allen Hatcher, Cambridge University Press, 2002

Supplement: Topology and Geometry, by Glen Bredon. Springer-Verlag, GTM #139, 1997.

Grade: Based on problem sets, exams, and class participation

► Course Description

This course provides an introduction to the concepts of **Algebraic Topology**, with an emphasis on homological methods, and with applications to problems in homotopy theory, geometry and combinatorics. It consists of three inter-connected parts:

1. Homology Theory and CW Complexes

Starts with simplicial complexes and simplicial homology groups. Proceeds to singular homology, homological algebra (exact sequences, axioms), Mayer-Vietoris sequence, CW-complexes and cellular homology, calculation of homology of cellular spaces, and homology with coefficients.

2. Cohomology Theory

Cohomology groups, universal coefficients theorems, Bockstein homomorphism, Künneth formula, cup and cap products, Hopf invariant, Borsuk-Ulam theorem, Brouwer and Lefschetz-Hopf fixed-point theorems.

3. Manifolds and Duality

Orientation bundle, Poincaré duality, Lefschetz duality, Alexander duality, Euler class, Lefschetz numbers, Gysin sequence, intersection form, and signature.

For more information, see some older syllabi, from [1998](#), [1999](#), [2003](#), and [2004](#). You may also want to look at some past qualifying exams in [Topology](#), based in part on the material covered in this course.

For the first homework, I recommend using the [Simplicial Homology](#) package, which runs under GAP. (The software is already installed on our network.)

► Homework Assignments

Upcoming.

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Started: August 14, 2005

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