

Topology I

MATH 70800, Spring 2021

Mon & Wed 12:00 – 1:30 pm, Online

Ph.D Program in Mathematics, CUNY Graduate Center

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Office Hours: Wed 2 - 3:30 pm, online

Course Description: This is the second part of the graduate Topology sequence. We will learn techniques and applications of Algebraic Topology to study topological spaces. Topics covered will include Simplicial & Singular Homology, Homotopy Invariance, Exact Sequences and Excision, Cellular homology, Homology with Coefficients, Axioms for Homology, Cohomology of Spaces, Cup Products, Poincare Duality and Products. We will cover additional topics if time permits. In addition to rigorous proofs, we will do lots of examples and computations.

Text Book: *Algebraic Topology* by Allen Hatcher, Cambridge University Press, ISBN 0-521-79540. We will cover Chapters 2, 3 and some additional topics at the end of each chapters. The textbook freely available at: <http://www.math.cornell.edu/~hatcher/AT/ATpage.html>

Homework and Exams: Homework will be assigned every other week, posted on the class homepage, collected and graded. There will be a final exam at the end of the course. For those taking the Qualifier in Topology in May, it can serve as the Final Exam.

Reference Books:

1. *Elements Of Algebraic Topology*, by Munkres, Westview Press.
2. *An Introduction to Algebraic Topology*, by Rotman, Springer-Verlag GTM.
3. *Homology theory. An introduction to algebraic topology* by James Vick, Springer-Verlag GTM.