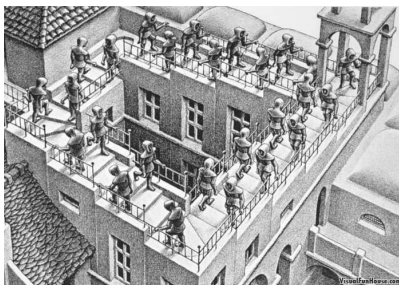


# Math 6441

## Algebraic Topology

Fall 2012



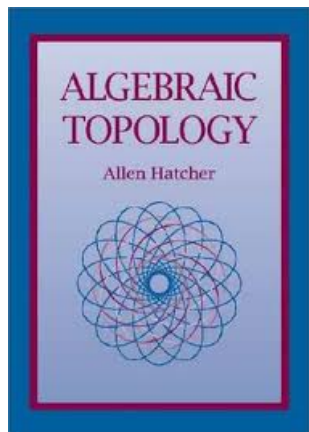
-----M.C. Escher

News: Welcome to Math 6441!

## Class Meetings

Tuesday and Thursday, 1:35-2:55 pm, Skiles 254.

## Book



## Office Hours

In Skiles 244, Tuesday and Thursday after class and by appointment.  
Jamie Conway, Monday 1-2, Skiles 165  
Robert Krone, Wednesday 4-5, Skiles 147

## Problem Session

In Skiles 005, Wednesday 4-5.

## Homework

There will be weekly homework assignments. Students should work in groups of (approximately) five people. Each student should write up (approximately) one fifth of the problems for the group. Each paper

should be labeled clearly with the author at the top and the other group members underneath.

## Graders

- Jamie Conway, Skiles 165
- Robert Krone, Skiles 147

## Grading

Grades will be tabulated according to the following scheme:

Homework 50%, Midterm 20%, Final 30%.

## Weekly Schedule

Note: The class notes below are in large part abridged portions of our textbook, by Allen Hatcher. I take no credit for originality.

Week	Dates	Topics	Text Sections	Homework	Lectures	Notes
1	Aug 21/23	Cell complexes	Chapter 0	p. 18 # 1,2,3,9,10,14,16,17,18,20	<u>Week 1</u>	
2	Aug 28/30	Fundamental group	Section 1.1	p. 38 # 6,7,8,9,10,12,16,17,18,20	<u>Week 2</u>	
3	Sep 4/6	Van Kampen's theorem	Section 1.2	p. 52 # 1,3,7,8,9,11,14,16,17,22	<u>Week 3</u>	
4	Sep 11/13	Covering spaces	Section 1.3	-	<u>Week 4</u>	
5	Sep 18/20	Classifying spaces	Section 1.3	p. 79 # 4, 5, 9, 10, 11, 12, 13, 14, 18, 19	<u>Week 5</u>	
6	Sep 25/27	Homology	Section 2.1	-		<i>Substitute teacher</i>
7	Oct 2/4	Homology	Section 2.1	p. 131 # 3,4,6,7,8	<u>Week 7</u>	<i>Exam</i>
8	Oct 9/11	Homology	Section 2.1	p. 131 # 2,9,11, 12, 13	<u>Week 8</u>	
9	Oct 18	Relative homology	Section 2.1	p. 131 # 15, 16, 17, 18, 20		<i>Fall break</i>
10	Oct 23/25	Excision / Mayer-Vietoris	Section 2.1	p. 131 # 19,22,23,28,29	<u>Weeks 9-10</u>	
11	Oct 30/Nov 1	Applications	Section 2.2	p. 176 # 2,8,10 p. 184 # 2,5	<u>Week 11</u>	
12	Nov 6/8	Cohomology	Section 3.1	p. 204 # 5,6,8,9,13	<u>Week 12</u>	
13	Nov 13/15	Products	Section 3.2	-	<u>Weeks 13 and 14</u>	

14	Nov 20	Products	Section 3.2	p. 228 # 1,3,4,5,7,10,11,14,15,18		Thanksgiving
15	Nov 27/29	Poincaré duality	Section 3.3	p. 258 # 7,10,11,24,25,26	<u>Week 15</u>	
16	Dec 4/6	Poincaré duality	Section 3.3	-	<u>Course notes</u>	Exam

## Resources

---[Algebraic Topology](#), Allen Hatcher

---[Lecture Notes in Algebraic Topology](#), James F. Davis and Paul Kirk

---[Algebraic Topology Class Notes](#), Denis Sjerve (notes by Benjamin Young)

---[Algebraic Topology I](#), Tim Perutz

---[algebraic topology](#), Michael Hopkins (notes by Eva Belmont and Akhil Mathew)

---[Algebraic Topology](#), Len Evans and Rob Thompson

---[Spectral Sequences in Algebraic Topology](#), Allen Hatcher

---[Homology: An idea whose time has come](#), Barry A. Cipra

---[Assembling geometric data using statistics for topology](#), Peter Bubenik

---[Barcodes: The Persistent Topology of Data](#), Robert Ghrist

---[Persistent Homology - a Survey](#), Herbert Edelsbrunner and John Harer

---[Computing Persistent Homology](#), Afra Zomorodian and Gunnar Carlsson

---[A History of Duality in Algebraic Topology](#), James Becker and Daniel Gottlieb

---[Duality in Mathematics and Physics](#), Sir Michael Atiyah

---[T-Square](#)

---[Georgia Tech Honor Code](#)