

MATH 427 & 527, FIRST WINTER TERM, 2015-2016

1. CONTACT INFORMATION

The instructor for this course is me, Ben Williams. I may be reached at tbjw@math.ubc.ca.
The course website is <http://www.math.ubc.ca/~tbjw/527/index.html>.

OFFICE HOURS:

By appointment, in MATX 1203.

2. MEETING TIMES

The course meets Mondays, Wednesdays and Fridays in MATH 203.

3. TEXTBOOK

The textbook for this course is *Algebraic Topology* by A. Hatcher. A free online pdf version is available.

4. HOMEWORK

Homework will be assigned throughout the course, at a rate of approximately one assignment every two weeks. The first assignment will be due on Friday 18 September, in class.

5. EXAMS

Two take-home exams will be assigned, one about halfway through the course, the other close to the end. These will take the place of homework assignments. Collaboration will not be permitted on the take-home exams.

6. OVERALL COURSE GRADE

The overall course grade will be assigned based on homework and exams.

7. LIST OF TOPICS

The following is a provisional list of topics that will be covered.

Week 1	Δ complexes and their orientations. Chain complexes. Simplicial homology of Delta complexes.
Review of point-set topology. Review of the fundamental group.	
Week 2	Week 3

	Singular Homology. Homological algebra.	Universal Coefficients.
Week 4		Week 9
		Cup product.
	Singular Homology (continued) Homological algebra (continued)	Week 10
Week 5		Topological Manifolds. Poincaré Duality.
	Equivalence of singular & simplicial homology. Cellular Homology.	Week 11
Week 6		Poincaré Duality (continued) Twisted coefficients.
	Axiomatic Homology The Künneth Formula for Homology.	Week 12
Week 7		Applications & calculations of cohomology.
	Homology and the fundamental group. Applications & Calculations of Homology.	Week 13
Week 8		Čech cohomology. Sheaves & introduction to sheaf cohomology.
	Singular Cohomology.	