

# Math 427/527: Topics in Topology/Algebraic Topology I

January–April 2017

**Instructor:** Omar Antolín Camarena, [oantolin@math.ubc.ca](mailto:oantolin@math.ubc.ca)

**Course website:** <http://www.math.ubc.ca/~oantolin/mathX27>

**Description:** This is an introduction to Algebraic Topology. We will cover homology and cohomology theory including the ring structure on cohomology and Poincaré duality for orientable manifolds. We will mention (but not thoroughly cover) other topics such as the fundamental group, covering spaces and higher homotopy groups.

**Prerequisites:** For people taking this as MATH 427, MATH 426 is a prerequisite. Generally speaking, some knowledge of topological spaces (say, compactness, connectedness and quotient topologies) and of linear algebra (or even better, rings and modules) is recommended.

**Classes:** Monday, Wednesday and Fridays from 10am to 11am in SWNG 305.

**Office Hours:** Will be announced on the course website.

**Recommended books:** We are fortunate to live in a time when many excellent books are freely available online from the author's web page. In the following list, all books titles are links to electronic versions.

For the main content of the course I recommend:

- Allen Hatcher, *Algebraic Topology*. Cambridge University Press, Cambridge, 2002.
- Peter May, *A Concise Course in Algebraic Topology*. The University of Chicago Press, 1999.

Those books are *very* different in style, so if one doesn't suit you, definitely try the other!

We will use some basic Category Theory throughout, for which I recommend:

- Emily Riehl, *Category Theory in Context*. Aurora: Dover Modern Math Originals.

To review the fundamental groupoid and covering spaces:

- Ronald Brown, *Topology and Groupoids*. Printed and Distributed by Createspace, 2006.

**Grading:** Grades will be based on homework assignments, which will be assigned approximately every two weeks.