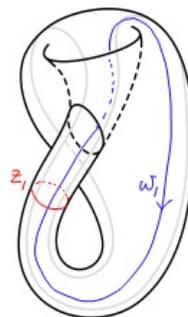


Math 581–1: Algebraic Topology (Fall 2017)

Time	Tue,Thu 1:25–2:40 pm
Location	SPRK 233 (Pullman), VECS 120 (Vancouver)
Instructor	Bala Krishnamoorthy
Office	VUB 347 (Vancouver)
Office Hours	Tue 3–4 pm, Wed 2–3 pm, or by appt. (Skype,Google: wsucomptopo)
Email	bkrishna@math.wsu.edu
Web page	www.wsu.edu/~kbala/AlgTopo/
Text	James R. Munkres: Elements of Algebraic Topology Westview Press, ISBN: 0201-62728-0. Allen Hatcher: Algebraic Topology Full book at math.cornell.edu/~hatcher/AT/ATpage.html



Description of the Course

Algebraic topology uses techniques from abstract algebra to study how (topological) spaces are *connected*. Most often, the algebraic structures used are groups (but more elaborate structures such as rings or modules also arise). A typical approach projects continuous maps between topological spaces onto homomorphisms between the corresponding groups. This course will introduce basic concepts of algebraic topology at the first-year graduate level.

We will follow mostly the book *Elements of Algebraic Topology* by James R. Munkres, and cover in a fair bit of detail the topics on homology of simplicial complexes, relative homology, cohomology, and, if time permits, the basics of duality in manifolds (selected Sections from Chapters 1–5 and 8). We will also refer to the book *Algebraic Topology* by Allen Hatcher for some of the topics. But unless there is strong interest, we will not cover topics related to the fundamental group. We will stress geometric motivations as well as applications (where relevant) throughout the course.

Prerequisites: Some background in general topology as well as abstract algebra, both at the undergraduate level, will be assumed. In particular, familiarity with the concepts of continuous functions, connectedness, and compactness, as well as with the concepts of groups, homomorphisms, fields, and vector spaces will be helpful to follow the course. But no particularly deep theorems from these topics will be needed. Some flexibility could be afforded as far as this background is concerned—please contact the instructor if you are interested in the class, but have doubts about the background required.

Organization and Grading

The course will have around **eight** homework assignments, which include mostly theoretical, i.e., “pen-and-paper” problems. Each student will also be required to make one long, or a few short, blog post(s). These posts could be made on a topic chosen from the textbooks (but not covered in the lectures), or from 1–2 research papers. The overall grade will be assigned using the following weights: **homework–75%**, **blog posts–25%**. There will be no exams.

Academic Integrity: Discussion of homework problems with others is allowed, and is also encouraged. But each person should hand in his or her own written solutions. Plagiarism or cheating will not be tolerated. Such behavior will result in a zero grade for a graded item and possibly a failing grade for the entire course.

Students with Disabilities: Reasonable accommodations are available for students with a documented disability through the Access center in Pullman. All accommodations **MUST** be approved through the Access Center (Pullman, Washington Building, Room 217). Please stop by or call 509-335-3417 for the Access Advisor.

WSU Safety Measures: Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Please visit safetyplan.wsu.edu and oem.wsu.edu/emergencies to access the Campus Safety Plan and emergency information. You should also become familiar with the WSU Alert Site (alert.wsu.edu) where information about emergencies and other issues affecting WSU will be found.