Math 961 – Algebraic Topology II
MSU – Spring 2019

Instructor: Dr. Katherine Raoux
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Email is generally the best way to reach me.

Course meets: Mon & Wed 1:00-2:20 pm Wells Hall C517

Office hours: Mon & Wed 2:30-4:00 pm

Class Etiquette: The classroom should be a place where open discussion and collaboration flourish. Building an environment where students feel comfortable asking questions takes effort on the part of the professor and the students.

I encourage you to ask and answer each other's questions in a respectful manner. I value your questions and will do my best to answer them! This platform for open discussion extends outside of the classroom to office hours and student interactions.

I also expect that email correspondence is thoughtful and respectful. This includes addressing your correspondence properly, e.g. "Dear —," and signing, e.g. "Best, —".

Course overview

This is a second course in Algebraic Topology. We assume students are familiar with fundamental groups, covering spaces, homology and cohomology theories, as well as with basic point-set topology, smooth manifolds and vector bundles. We will discuss some background material in lecture as needed.

Our main focus will be on the theory of characteristic classes. Characteristic classes are cohomology classes that are invariants of vector bundles. Roughly speaking, they measure how a vector bundle is twisted or nontrivial.

If time permits, we may also discuss other topics.

Textbook and other references

Our main text will be *Characteristic Classes* by John Milnor and James Stasheff. Other relevant texts include:

- *Vector Bundles and K-theory* by Allen Hatcher
- *Lecture Notes in Algebraic Topology* by James Davis and Paul Kirk especially Chapters 4 & 7
- *Characteristic Classes* notes by Robert Bruner, Michael Catanzaro, and Peter May.

All texts are available for free online or through the MSU library.

Homework

I will periodically assign exercises. You are encouraged to discuss the exercises with your classmates.

There will be no formal written exams in this course.

Important Dates for Spring 2020

Monday, 1/6: Classes Begin
Friday, 1/10: Online open enrollment ends (8pm)
Friday, 1/17: Last day to late add a course or change sections within a course. Last day to drop to a lower level course. Students go to Undergraduate office, C212 Wells Hall for Mathematics enrollment changes.
Monday, 1/20: Holiday - University Open, Classes Cancelled
Friday, 1/31: Last day to drop with refund (8pm)
Wednesday, 2/26: Middle of Semester. Last day to drop with no grade reported (8pm)
Mon-Fri 3/2-3/6: Spring Break
Friday, 4/24: Last day of classes