Math 751 Syllabus
Introductory Topology I

COURSE INFORMATION

Introductory Topology I
MATH 751 001 (3 Credits)
Fall 2018

Description: This is the first course in the basic graduate topology sequence. The core topics are homotopy equivalence, fundamental group, covering spaces, and homology.

Prerequisite(s): MATH 551 and MATH 541 or equivalent

Instruction Mode: Classroom Instruction

Department: MATHEMATICS

Webpage URL: https://www.math.wisc.edu/~dymarz/751-2018 (Main course site for Fall 2018)

Location and Schedule: Van Vleck 115 MWF 11:00AM-11:50AM

How the Credit Hours are Met
This class meets for three 50-minute class periods each week over the semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for *about 2 hours out of classroom for every class period.* The syllabus includes additional information about meeting times and expectations for student work.

Instructor: Prof. Tullia Dymarz dymarz@math.wisc.edu, Van Vleck 509
Office hours Tuesdays 4:00-5:00 pm in VV 509 and right after class in B115

Grader TBA

GRADING AND COURSE MATERIALS

- Homework (30%) due Friday at the beginning of class
- in class midterm (30%) Oct. 26 (no books/notes/internet)
- take home final (40%) Dec. 12

Grading will be assigned as follows:

- A if based on exams/homework I believe you will pass the first half of the topology qualifying exam.
- AB if based on exams/homework if I believe that with some extra work you will pass the first half of the topology qualifying exam.
- B if based on exams/homework I believe you will fail the first half of the topology qualifying exam.
- F if little or no work was done.

Textbook: *Algebraic Topology* by Allan Hatcher Chapters 0-2
http://pi.math.cornell.edu/~hatcher/AT/ATchapters.html

Course Learning Outcomes

At the end of this course students will be able to understand the following concepts and prove theorems relating to them

- homotopy equivalence, mapping cylinders and cones, contractible spaces, cell complexes, homotopy extension property

- path homotopy, fundamental group, simply connected, fundamental group of the circle and higher dimensional spheres, invariance under homeomorphism, Van Kampen's theorem, free products, applications to cell complexes, covering spaces, homotopy lifting property, classification of covering spaces, deck transformations and group actions, Cayley complexes, free groups, $K(\pi, 1)$ spaces.
- Δ-complex, chain complex, boundaries, kernels, simplicial homology, singular homology, homotopy invariance, exact sequences and exision, relative homology groups, degree, cellular homology, real and complex projective spaces, Euler characteristic, Mayer-Vietoris sequence, homology with coefficients, axiomatic homology, homology and fundamental group, Borsuk-Ulam theorem, Lefschetz Fixed point theorem, cellular approximation

Homework: Assigned every two weeks, posted at `https://www.math.wisc.edu/~dymarz/751-2018`, due *Fridays beginning of lecture*. Graded for completion and one or two problems graded for accuracy. Homework is meant to be challenging and to push you to learn the material in depth. Do not expect to know what to do immediately. Try hard enough to solve the problems on your own using only the course notes and your own lecture notes. You can discuss the material with others and consult other sources but *you must specify your collaborators and sources on each homework*. Every student must submit their own written version of the homework solutions. Hand in homework at the *beginning* of Friday lecture. *No email submissions. No late submissions.* The lowest homework scores will be dropped from your homework grade.

ACADEMIC POLICIES

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to https://conduct.students.wisc.edu/academic-integrity/

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php

DIVERSITY & INCLUSION

Institutional statement on diversity: "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world." https://diversity.wisc.edu/