

MA440 – General Topology

Instructor: Steven Jackson

Office: Sci-3-082

E-mail: jackson@math.umb.edu

Phone: (617) 287-6469

URL: www.math.umb.edu/~jackson/

Course Description

Math 440 is an introduction to the abstract theory of continuity and convergence, otherwise known as *general* (or *point-set*) *topology*. Topics include set theory; metric spaces and topological spaces; continuity; subspaces, product spaces, and quotient spaces; sequences, nets, and filters; separation and countability; compactness; connectedness; and the fundamental group. See the course calendar for more detailed information.

Prerequisites

Admission to the course is contingent upon successful completion of Math 360, or permission of the instructor. (This course depends only on elementary group theory, and makes use of it only towards the end, so students taking Math 360 simultaneously should experience no unusual difficulty.)

Text

There is one required text for the course: *General Topology* by Stephen Willard.

Grading

Course grades are based on weekly quizzes (20%), two in-class tests (20% each), and a cumulative final exam (40%).

Reading and class preparation

There is a reading assignment associated with each class period. Although it is not generally possible to discuss every topic in class, students are responsible for the entire content of the reading assignment. *Test and exam questions may cover reading material not discussed explicitly in class.* Consequently it is very important to complete the reading assignments on time and to come to class prepared with questions.

Make-up tests

Tests may be rescheduled only in cases of serious illness, bereavement, or other circumstances of similar gravity. Whenever possible, arrangements for make-up tests must be made *in advance* of the regularly scheduled testing time.

Student conduct

Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the catalog of Undergraduate Programs, pp. 44–45 and 48–52. The Code is available online at the following web site:

http://cdn.umb.edu/images/life-on-campus/Code_of_Conduct_5-14-14.pdf

Web page

This syllabus and other course materials are available on-line at

http://cartan.math.umb.edu/wiki/index.php/Math_440,_Fall_2014

Course Calendar

*Homework problems should be done prior to the due date but **are not to be handed in.** One problem from each assignment will appear on the weekly quiz.*

Tuesday, September 2: Introduction.

Thursday, September 4: Set theory.

Read before class: Section 1.

Tuesday, September 9: Metric spaces.

Read before class: Section 2.

Do before class: Assignment 1.

Thursday, September 11: Topological spaces.

Read before class: Section 3.

Tuesday, September 16: Neighborhoods.

Read before class: Section 4.

Do before class: Assignment 2.

Thursday, September 18: Bases and subbases.

Read before class: Section 5.

Tuesday, September 23: Subspaces.

Read before class: Section 6.

Do before class: Assignment 3.

Thursday, September 25: Continuous functions.

Read before class: Section 7.

Tuesday, September 30: Product spaces and weak topologies.

Read before class: Section 8.

Do before class: Assignment 4.

Thursday, October 2: Quotient spaces and strong topologies.

Read before class: Section 9.

Tuesday, October 7: Inadequacy of sequences.

Read before class: Section 10.

Do before class: Assignment 5.

Thursday, October 9: Exam 1 (sections 1, 2, 3, 4, 5, 6, 7, 8, and 9; assignments 1–5).

Tuesday, October 14: Nets.

Read before class: Section 11.

Do before class: Assignment 6

Thursday, October 16: Filters.

Read before class: Section 12.

Tuesday, October 21: Separation axioms.

Read before class: Section 13.

Do before class: Assignment 7.

Thursday, October 23: Regularity and complete regularity.

Read before class: Section 14.

Tuesday, October 28: Normal spaces.

Read before class: Section 15.

Do before class: Assignment 8.

Thursday, October 30: Countability properties.

Read before class: Section 16.

Tuesday, November 4: Compact spaces.

Read before class: Section 17.

Do before class: Assignment 9.

Thursday, November 6: Locally compact spaces.

Read before class: Section 18.

Thursday, November 13: Exam 2 (sections 10, 11, 12, 13, 14, 15, and 16; assignments 6–9).

Tuesday, November 18: Connected spaces.

Read before class: Section 26.

Do before class: Assignment 10.

Thursday, November 20: Pathwise and local connectedness.

Read before class: Section 27.

Tuesday, November 25: The homotopy relation.

Read before class: Section 32.

Do before class: Assignment 11.

Tuesday, December 2: The fundamental group.

Read before class: Section 33.

Do before class: Assignment 12.

Thursday, December 4: The fundamental group of the circle.

Read before class: Section 34.

Tuesday, December 9: Preview of algebraic topology.

Do before class: Assignment 13.

Thursday, December 11: Review.

Do before class: Assignment 14.