

Department of Mathematics
Mat 530: Topology/Geometry I
Fall 2003

Lecturer: Santiago R. Simanca. **Phone:** 2-8277. **Office:** Math 4-115. **E-mail:** santiago@math.sunysb.edu. **Office hours:** MWF 10:00-11:00, or by appointment.

Classroom: Math Tower 5-127. **Time:** MWF 11:45-12:40.

Textbook: Topology, *a first course*, by James R. Munkres, Prentice Hall.

Description: This course is an introduction to Topology, subject that has become a central part of mathematics. As a core course in the Department's Ph.D program, it has a set-up syllabus that covers

- **Basic point set topology**
 - Metric spaces.
 - Topological spaces and continuous maps.
 - Comparison of topologies.
 - Separation axioms and limits.
 - Countability axioms, Urysohn metrization theorem.
 - Compactness and paracompactness, Tychonoff theorem.
 - Connectedness.
 - Product spaces.
 - Function spaces and their topologies, Arzela-Ascoli theorem.
- **Introduction to Algebraic Topology**
 - Fundamental group.
 - Fundamental group of S^n ; fundamental group of surfaces.
 - Seifert-van Kampen theorem.
 - Classification theorem for surfaces.
 - Classification of covering spaces, universal covering spaces.
 - Homotopy, essential and inessential maps.

We will spend about 2/3 and 1/3 of the time on each of these topics, respectively.

Homework: exercises from the textbook will be assigned weekly, their written solutions to be submitted the following week.

Examinations: There will be a midterm and a final examination, as indicated below:

Test	Date	Time
Midterm	October 20	11:45-12:40

Final	December 15	8:00-10:30
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Grading: your grade will be based on your work on the assignments and your results of the tests. The final exam accounts for 40% of the total grade.

Schedule: The following is a tentative week by week schedule for the course, based on the sections of the textbook (a schedule based on the latest version of the textbook may be found [here](#)).

We will make adjustments if and when necessary. You are strongly urged to read the relevant parts of the textbook **before** class.

I will assume that you are familiar with the main aspects of Chapter 1. I will cover most of Chapters 2 through 8, except for Chapter 5 and Chapter 6 that will be discussed only briefly.

Week of	Sections Covered	Exercise assignments
Sept. 1	2.1, 2.2, 2.3, 2.4	p. 83: 1,4,5,6,7; p. 91: 3,4,7,8
Sept. 8	2.5, 2.6, 2.7, 2.8, 2.9, 2.10	p. 100: 4,6,9,10,18; p. 110: 1,3,4,6,7,12,14; p. 116: 5,8; p. 124: 3,4; p. 132: 1,3,6,8,12
Sept. 15	2.11, 3.1, 3.2, 3.3	p. 143: 4,5,6,7; p. 151: 2,4,6,10,11; p. 158: 1,3,4,6,7,8,10,12
Sept. 22	3.4, 3.5, 3.6	p. 163: 3,4,7,8; p. 171: 3,4,6,9; p. 177: 2,3,6
Sept. 29	3.7, 4.1, 4.2	p. 181: 3,6,7; p. 194: 2,7a,8,12; p. 205: 1,2,5,7
Oct. 6	4.3, 4.4, 4.5	p. 215: 2,7,8; p. 220: 1,3,5
Oct. 13	5.1, 6.5, 7.1, 7.2, 7.3	p. 259: 9,10, 269: 2,5; p. 274: 1,2,3,4; p. 278: 1,4,6
Oct. 20	7.4, 7.5, 7.6, Midterm	p. 283: 5,7
Oct. 27	8.1, 8.2, 8.4	p. 325: 1, 5; p. 330: 1, 2, 3, 4, 5, 6d; p. 341: 5
Nov. 3		see version based on newest edition of textbook
Nov. 10		
Nov. 17		
Nov. 24		Thanksgiving

Dec. 1		
Dec. 8		Dec. 12: last day of classes
Dec. 15	Final Exam	

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, please contact the staff in the Disabled Student Service Office, Room 133, Humanities, 632-6784/TDD. DSS will review your concerns and determine with you what accommodations are necessary and appropriate. All information and documentation of disability is confidential.



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