Elementary Topology                     Fall 2004
MT 360-55                                  Syllabus

Time:   TR 2:30-3:45 p.m.  
Classroom: ALT 324  
Instructor: Dr. Dena Morton  
Office: Hinkle 111  
Phone: x3674

Office Hours:  
- Mondays from 1:30-3:00
- Tuesdays from 1:00-2:00 and 4:00-4:30
- Thursdays from 1:00-1:30 and 4:00-4:30
and by appointment.

e-mail: morton@xavier.edu

Note: this is the best way to reach me – I check my e-mail on a regular basis.

Web Page: http://cerebro.xu.edu/~morton/

Note: I update my webpage every day – all homework assignments and readings are always posted online. Also, check out the beautiful mathematical pictures!

Purpose and Content: MATH 360 is a course in point-set topology. We will start with the notions of open and closed sets, continuity, compactness and connectedness in the usual setting of \( \mathbb{R}^n \). Next we will study metric spaces and topological spaces and explore various topologies that may be defined. We will examine the continuity of functions on topological spaces, connectedness and compactness of topological spaces, and separation axioms for topological spaces. We will also build new spaces from old ones using product and quotient axioms. If time allows, we will classify compact, connected surfaces and examine topological invariants of spaces.

It is essential that you be conscientious about completing both the reading and homework assignments on time, and at least attempt every assigned problem. Questions are welcome at any time during class. I encourage you to participate actively in class by asking questions and by answering questions posed by either myself or by other students.

Text: Topology of Surfaces, by L. Christine Kinsey

Homework: Problem sets will be assigned weekly.

Quizzes: Weekly quizzes on topological definitions will be given on Tuesdays. I will grade these on a 5-point scale. Makeup quizzes will not be given. Quizzes will not be given during exam weeks. Note: These quizzes are invaluable - if you don’t know the definitions, you cannot possibly expect to do the mathematics.

Exams: There will be two exams given throughout the semester, both involving a take-home and an in-class component. There will also be a comprehensive final exam. (also with two components) If you must miss an exam for religious or academic reasons, or in cases of illness or emergency, you must submit a written excuse. A makeup may be scheduled -- this will be decided on a case-by-case basis.

Prerequisite: There are no content prerequisites listed for Math 360. However, Math 360 is an upper-level elective and will, at times, be very abstract. The bulk of your work will be proof-writing. Therefore, it may be to your advantage to have some prior experience with proof-writing. If you have had Math 370 (Introduction to Real Analysis) some of our discussion may be familiar, but I do not assume any of the content of that course. You should have a good grasp of the properties of the various set operations (union, intersection, complement) and their application to indexed collections of sets. This material will be very briefly reviewed.

Grading:  
- Weekly quiz performance: 5%
- Two (in class) exams: 17% each
- Weekly graded problem sets: 30%
- Research paper: 10%
- Final exam (cumulative): 21%
Each exam will be curved separately and assigned a number grade between 0.0 (the lowest possible F) and 5.0 (the highest possible A). I will announce the cutoffs when returning the exam. If, for example, the cutoff for an A is 87 and the cutoff for a B is 71 and you get an 83, then the number grade corresponding to your 83 would be a 3.75 (B corresponds to 3.0 and you are 12/16=.75 of the way to the next cutoff). The homework and quizzes will be treated similarly. The total course grade may be curved further (that is, a 3.9 would result in an A or A- in the course), but the resulting curve will never lower your grade (that is, a 4.1 would always result in at least an A- in the course). +/- grades may be assigned in borderline cases. I reserve the right to assign a grade of “F” to any student who earns less than 50% on the final exam.

**Important Dates:**

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<thead>
<tr>
<th>Thursday, Sept. 30</th>
<th>Exam I</th>
<th>Monday, Nov. 22</th>
<th>Final date to withdraw</th>
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<tbody>
<tr>
<td>Thursday, Oct. 7</td>
<td>Fall Holiday</td>
<td>Thursday, Nov. 25</td>
<td>Thanksgiving Holiday</td>
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<td>(No classes)</td>
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<tr>
<td>Tuesday, Oct. 26</td>
<td>Academic Day</td>
<td>Thursday, Dec. 9</td>
<td>Last day of Classes</td>
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<td>(No classes)</td>
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<tr>
<td>Tuesday, Nov. 16</td>
<td>Exam II</td>
<td>Tuesday, Dec. 14</td>
<td>Final Exam 1:00 p.m.</td>
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**Attendance:** Class attendance is crucial. Lectures include the introduction and explanation of new topics, explorations of graphing calculators, and solutions of calculus problems. Class notes are to be used in conjunction with the text, in order to elicit a fuller understanding of Calculus.

*Please be courteous and come to class on time!*

University policies on attendance are stated on p.45 of the undergraduate catalog.

**One Minute “Quiz”:** At the end of some class periods I will ask you to hand in a sheet of paper on which you have filled out the following:

1. What was the most important topic covered today? (That is, what was the main point?)
2. What was the most confusing idea that was covered today? (That is, which concepts did you find complex or hard to understand?)
3. Any questions or comments?

You need not sign your name unless you have a specific question that you want me to address to you. I will frequently respond to one-minute quizzes during the next class period.

**Group Work:** Working in a group can be beneficial for everyone involved, provided that you do not abuse the privilege. Make sure that everyone in your group is making a contribution. Do not copy answers from one another, as this will only backfire against you come test-time. Instead, let concepts gel after group discussion, and then write up the solutions by yourself.

**Academic Honesty:** You are expected to conduct yourself with integrity in this course. Cheating will be dealt with as harshly as University regulations permit; measures will be taken during exams to prevent cheating. Students are directed to p. 50 of the undergraduate bulletin for further information.

**How to Do Well in this Course:** Come to class! Come visit me during office hours! Read the text! Try the problems! Smile! Study hard! Read your class notes! Make sure you keep up with the material in class! Review your class notes! Don’t Panic! Enjoy! Most important of all, if you feel that you are falling behind, or that you do not understand a certain topic, or if you would just like to discuss a mathematical idea (or anything else), come to visit me in my office. That’s why I am here!