Course Information Math 590: Topology

Instructor	Nicholas Vlamis	**Office**	1859 East Hall
E-mail	vlamis@umich.edu	**Office Hours**	M 3–4pm
Class	MWF 12:10–1pm, 3088 East Hall		W 1–2pm
Website	Access through Canvas.		F 11am–12pm

Course Description

This is a standard course in point-set topology. The core of the course will consist of the material in chapters 2 and 3 of Munkres, namely topological spaces, continuity, connectedness, and compactness. Depending on the time remaining, the course will be supplemented with additional topics.

Topology was founded with the goal of finding a minimal set of axioms so that standard notions and theorems coming from the study of Euclidean spaces would generalize to a much broader collection of spaces. In the modern setting, topology studies the global structure of a space, which is counter to the local nature of geometry and analysis. This is explored in greater depth in the field of algebraic topology, which makes up Part II of Munkres's text. Time permitting, we will see the beginning of this field.

Prerequisites. There are no formal prerequisites for this course. However, familiarity with writing proofs will be assumed.

Course Materials

Canvas. You will need to use the Canvas course site to access homework files and to view grades.

Course Textbooks. The book for this class has been the standard text for a first course in topology for a very long time. We shall keep the tradition.

> *Textbook*   Munkres, James (2000). *Topology (2nd Edition)*. Pearson.

It is important that you get the second edition of this book. The first edition (released in 1974) is missing Part II, which I hope we have time to discuss.

Office Hours. I encourage you to attend office hours! Office hours are a great place to spend extra time on the course material and help you build your understanding and skill. I have provided times for my office hours at the top of the syllabus, but if they conflict with the majority of schedules, they can be changed. In addition, you may always feel welcome to schedule an appointment with me if you cannot make it to office hours.

Accommodation. If you have a documented disability requiring special accommodations, please inform me as early as possible. Special arrangements for graded work require appropriate documentation.

Assessment Plan

Your course grade will be determined from the following categories and weights:

Homework	40%
Midterm	25%
Final Exam	35%

The tentative date for the midterm is **Thursday, February 25** from 6pm to 8pm. The final exam in on **Thursday, April 28** from 10:30am to 12:30pm.

Homework. Homework will be assigned every Wednesday and will be due in the beginning of class **two weeks** later. *Late homework will not be accepted.* The written homework for this class will consist of writing proofs (with few exceptions). As I cannot say it better myself, the following is borrowed from Professor Peter Scott:

The purpose of written homework in this course is twofold. One part is to test your understanding of the mathematics in the course, and the other is to test your skill in communicating mathematics. Don't think of your homework paper as a certificate proving that you have done the assignment. Think of it as an exercise in learning and in reporting what you have learned. There is a lot of truth in the statement "If you can't explain it, you don't understand it!". Imagine that you are explaining your solutions to someone who needs help, perhaps a classmate who has been sick. Start at the beginning and be clear, logical, and complete. The ultimate test of what you write is this: can someone learn from your paper? Easily? Remember, the reader will see only what you wrote, not what you meant to say. So it must all be there, and be accurate. Make your paper reader friendly.

Homework Format. You will be asked to write up and turn in a selection of the problems assigned weekly. Each of these problems will be graded on a 5 point scale. You will be graded on completion, correctness, and clarity. In addition, there will be problems marked as extra credit. These problems will go above the expectations of the course and will serve to introduce you to some new material. You may turn in these problems to be graded; if they are completely correct, then you will receive 5 homework points.

All written homework is **required** to be typeset with LaTeX (see below).

LaTeX

You are required to typeset your homework using LaTeX (pronounced "LAY-tekh" or "LAH-tekh"). LaTeX is the standard document markup language for writing mathematics. In the beginning there is a bit of a steep learning curve as you figure out the language, but I believe the pay-off is large. I found as a student that when I switched to writing homework in LaTeX I benefited greatly from being able to edit my writing; I believe you will find the same.

Distribution. For OS X, you can find the install files at https://tug.org/mactex/. In order to write a document in LaTeX you need an editor. This package includes two; I recommend using TeXShop.

For Windows, you can find the install files at http://miktex.org. This package *does not* include an editor. I would suggest Texworks (https://www.tug.org/texworks/). It is modeled on the aforementioned TexShop, which I use and am very happy with.

If you are using Linux, you probably know more about computers than me, so you can figure it out!

An alternative is to use a web application. I have used and liked ShareLaTeX (https://www.sharelatex.com). They also have a lot of resources to help you get started.

Resources. When distributing the homework, I will also distribute a LaTeX file as a template to get you started. Here are some additional resources:

- Google: the best way to learn LaTeX is to use LaTeX. I will provide the template to get you off the ground and so the most useful strategy is to get as far as you can and then use Google to find answers when you get stuck. There is a large community out there supporting LaTeX. You will regularly stumble on someone asking your question on StackExchange.
- The complete list of LaTeX symbols: http://tug.ctan.org/info/symbols/comprehensive/symbols-a4.pdf.
- Detexify: http://detexify.kirelabs.org/classify.html. This is a web applet (or you can get the smartphone app) that lets you draw a symbol you want to use. It will then tell you the command for the symbol as well as any additional required packages.
- Me: I'm happy to answer any LaTeX questions (after all, I'm the one forcing you to use it!).

Figures. If you would like to have figures as part of your document, you may simply hand draw them on a separate sheet and refer to them in your write up. *You do not need to draw figures with a computer.*