Purpose: This course is meant to accomplish several things. It acts as a fairly broad introduction to the rich fabric of mathematics developed over many hundreds of years and which is still being articulated today. This knowledge affords you an opportunity to join the community of mathematicians, both professionals and hobbyists, who share a common language despite their many different social and political differences. Part of our agenda here is to learn both to read, write, and speak that language more fluently by studying proofs, conjectures, and doing thought experiments in mathematics. Mathematics is a historically rich subject so we should also learn about our own mathematical experience through the stories of people and events which strongly shaped the mathematical landscape. The most important goal of our mathematical journey is for you to spend almost all our class time doing mathematics. This process of doing math can appear as a very slow journey indeed since it requires thought, experimentation, summary, revision, and finally a kind of enlightenment long sought by seekers of patterns in nature and language. The method used here is often called Guided Discovery. I will act as guide—you will make the discoveries. A final goal closely tied to this emphasis on doing math is to lead you toward becoming an independent learner and connoisseur of mathematics.

Texts: Our How to Prove It text is probably a radical departure from other mathematics texts you have used thus far. This book has quite MODEST goals for the scope of math it includes but HUGE consequences for how we will structure our class time. You will be doing the mathematics with the text primarily acting as a guidebook to set out some topics to consider. This is not a book to breeze thorough to get a view of lots of math topics in one semester. We will take a different route to understanding math by grappling with the details, exercises, conjectures, and theorems.

Group Work: Few mathematicians work on problems in a vacuum. One of the best ways to succeed at doing math is to have a group in which you play a contributing role. We will be doing quite a bit of group work in this class as well as some potential group presentations. This does not mean you should consider letting the other group members do the work for you! This is unfair to them and will seriously affect your grade in the class in a negative manner. The best combination of work environment is a combination of individual and group effort. I will provide additional guidance about group work as we get into the exercises themselves.

To get the most out of this course, I you might consider forming a study group to talk about the homework and readings outside of class. This is NOT an invitation to work the homework exercises by group effort (see below) then submit identical solutions by all the group members. Study groups offer an opportunity to discuss the mathematics involved in the exercises and then write up your own solutions. Again, your written answers to homework exercises are your responsibility!

Homework: There are two kinds of homework in this class. I will assign individual homework problems and collect your written answers to those the next class where we will talk about possible answers and approaches to creating answers to the homework. These homework questions you MUST do on your own without consulting with your group members or anyone else! I will also assign some homework exercises which can be discussed with your study group members. This allows group discussion of more open-ended mathematical concepts. I will not accept late homework for grading. Period. So as not to penalize students due to sickness or other unavoidable lapses, I will drop the two lowest homework grades.
I will be displeased if I receive essentially identical homework solutions on individual homework problems as this is extremely unlikely if you do your own writing. I do encourage you to work in groups as described above but your written solutions to exercises are your responsibility and your’s alone. This is the essence of exploration and discovery in every subject, not just mathematics. Solving problems and investigation on your own without being fully prepped on how to do everything in advance is how we build our skills.

**Seminar talks:** You are required to attend at least two math department seminar talks this semester. If the schedule works in its typical way, there will be a number of talks for you to attend. I will post notice of these events and take attendance at the talks. You will also be able to contribute comments and evaluations about the speaker from the student perspective.

**Class etiquette:** I try to provide a full day’s content and structure in each class and this may take various forms but I do not tend to shortchange the class in terms of energy or preparation on my part. I insist in return that some basic behaviors be observed in the class. Turn off your cell phones before coming to class. If you remotely think you may need a drink or need to use the toilet, do so BEFORE or AFTER class. No one appreciates audience members sauntering out in the middle of class discussion or lecture. This is rude behavior both to the speaker and remaining audience. Talking in class that is disruptive to the ongoing discussion is not acceptable. If we seem to be going too slow or belaboring a point in class, contribute to the discussion to help move us along! Don’t lose focus and start a side conversation to kill time.

**Exams:** There are two in-class midterm exams in this course on **Monday February 24th, and Friday March 28th**. Details on the format and content will be provided as we get closer to these exam dates.

**Presentations:** Notice there is no final exam in this course. Instead, there are individual presentations on research projects you will be working on throughout the semester and presenting toward the end of the course. The last day for presentations is during our scheduled final period, **Saturday May 10th, 8:30 – 11:30 am. Do not make any travel plans without consulting all these dates!** Again, more details are coming as we move along.

**Attendance:** You cannot get the most out of this experience if you do not participate, including attending class. Missing three or more classes by unexcused absences will result in a reduction of your final grade by at least one letter grade. Excused absences require documentation such as evidence of illness, required meeting with a dean, etc. Missing more classes means more reduction.

**Grades:** Grades will be calculated using all the points accumulated during the term with the following approximate values: Two midterm exams (200 points), individual presentations (100 points), homework (280 points) and class participation, attendance, etc (50 points). Precise values depend on the number of homework sets we complete.

**Center for Teaching and Learning:** Disability Accommodations: If you are a student with a disability for which you may need accommodations, you should self-identify and register for services with the Coordinator of Disability Services at the Center for Teaching and Learning (CTL), and provide documentation of your disability. Disability-related accommodations and services generally will not be provided until the registration and documentation process is complete. The guidelines for documenting disabilities can be found at the following website: [http://www.hws.edu/disabilities](http://www.hws.edu/disabilities)

Please direct questions about this process or Disability Services at HWS to David Silver, Coordinator of Disability Services, at silver@hws.edu or x3351.