

INTRODUCTION TO NUMBER THEORY  
FINAL PROJECT DESCRIPTION  
Spring 2016

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**Last Updated:** April 7, 2016

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1. FINAL PROJECT OVERVIEW

Each student in this course has now been assigned a final project topic and a group (or has indicated to me that they wish to take a final exam). This final project will account for **30 percent of your final grade**. Ultimately, you will write a 5-10 page article giving an overview of your chosen topic, and give a short presentation (at most 20 minutes) on the topic.

Having a sizable portion of your grade determined by a writing project is extremely unusual in a mathematics class. To do well on the final project, you must write something that is of very high quality. You will not need to include any original, new research, but you must show that you can

- (1) completely understand what you are writing and presenting, and
- (2) can write clear and correct mathematics with no typos.

I strongly encourage you to begin thinking about your project **right now!** Begin reading and talking with your groupmates. You should feel free to come talk to me before or after class, or during my office hours, or through email.

I will provide each group with some initial suggested reading material. You will then read about the topic (and it will almost certainly be necessary for you to go beyond the initial suggested reading material). There is an extreme shortage of good expository mathematics, so it will probably be necessary to spend some time digesting and understanding the material you come across.

You should write your paper at a level so that a student in this class, but not in your project group, could fully understand. Within your paper, **you must include** at least one proof of a result that we did not cover in class. Your presentation should be expository and designed to inform.

All projects that receive a grade of at least an 85% will be placed on the course website for others to look at in the future (no grade will be listed), contributing to the well-written expository mathematics available.

2. PRESENTATION SCHEDULE

Presentations will begin on Thursday, 28 April 2016, the last official class. Presentations will continue through class-time during reading period, beginning on Tuesday 3 May 2016. The papers will be due on Tuesday 3 May 2016, even if your group doesn't present until afterwards.

The order of presentations will be determined first by volunteer, and then afterwards by random choice. In other words, those groups that wish to present early can volunteer. After there are no more volunteers, I will choose groups in some random way, perhaps by drawing the groups out of a hat.

**You must attend your fellow students' presentations, even if you have already presented.**

### 3. GRADING

Your final grade will be a mixture of your paper grade and your project grade. So that you have a sense of how the papers will be graded, you will have one chance to turn in your paper before it is due for a preliminary grading. I will read the early version and give you feedback to incorporate in your final version.

For instance, if you wanted to turn in a draft of your project one week before the final project is due, I will look at it and give you some suggestions to improve the paper or your exposition.

### 4. ASIDE: FORMATTING A MATHEMATICAL PAPER

As you may have noticed, mathematics looks bad when written in Word, OpenOffice, LibreOffice, or GoogleDocs. These tools are simply not designed with the presentation of mathematics in mind. If you are interested in having your written paper *look good*, in addition to containing good content, I would encourage you to consider using the  $\text{\LaTeX}$ typesetting system. This is how all the materials I've provided for this course have been written.

Unfortunately, latex is somewhat annoying to first learn and has a high initial learning curve. The websites [sharelatex.com](http://sharelatex.com) and [overleaf.com](http://overleaf.com) provide extremely good (and free) tools for writing  $\text{\TeX}$ documents without requiring you to fully learn how latex works.

**This is entirely optional**, and will not affect your final grade. (But really, it looks so much better than all alternatives).