Math 419 Historical Perspectives of Mathematics Spring 2020

Instructor Amites Sarkar

Text A Concise History of Mathematics
Dirk Struik

Preface

This course will take place online through Canvas and Zoom. My priorities are to make the course accessible, and the grading fair. The ideal way to participate is synchronously, at the regularly scheduled meeting time of 3pm on Mondays, Tuesdays and Thursdays (I will host a Zoom meeting and invite everyone on the class list). However, I intend to record each class meeting, and make the recordings available through Canvas, so it should be possible to complete the class asynchronously, if need be. The grading will be based on written homework, covering both mathematical and historical topics.

Syllabus

I'll cover a selection of topics from the origins of counting to the invention of calculus.

Overview

It has been said that the insights of one generation become the instincts of the next. Subjects such as differential calculus were once a secret art understood only by a coterie of specialists – today they are taught to millions of people worldwide every year. The famous mathematician Louis Mordell once wrote:

Mathematical study and research are very suggestive of mountaineering. Whymper made several efforts before he climbed the Matterhorn in the 1860's and even then it cost the life of four of his party. Now, however, any tourist can be hauled up for a small cost, and perhaps does not appreciate the difficulty of the original ascent. So in mathematics, it may be found hard to realise the great initial difficulty of making a little step which now seems so natural and obvious, and it may not be suprising if such a step has been found and lost again.

This is precisely what makes the study of the history of mathematics both interesting and difficult. We have to try to get inside the minds of people who thought in a very different way and who did not have access to intellectual tools that we take for granted. A good example of such an intellectual tool is the number 0.

Class activities

Expect lectures, and, as the quarter progresses, discussions.

Grading and Homework

There will be eight written homework assignments, which will be posted online at regular intervals on the Canvas page. The first four will be worth 10%, and the last four will be worth 15% of the final grade. Both mathematical and historical topics will be covered. The source material is class lectures and the textbook. You should send me your solutions through Canvas, and I will provide feedback and evaluation of your work based on both the mathematical content and the writing style. I will also provide a list of writing resources on the Canvas page.

There will be no exams, but you are responsible for reading the parts of the book corresponding to the topics covered, for viewing each class either synchronously or asynchronously, and for completing the writing assignments, which I'll discuss in more detail in class. This is a Writing Proficiency course, so the majority of your grade will be based on the quality of your writing and the clarity of your ideas and arguments.

Course objectives

The successful student will demonstrate an understanding and appreciation of:

- The development of mathematics as a creative human activity
- The evolution of mathematical ideas over time
- The structure and rigor of mathematics as viewed from a historical perspective
- The relationships between different parts of mathematics
- The importance of primary sources

Office hours

Through Zoom, by appointment. My e-mail is amites.sarkar@wwu.edu