Math 3010: Topics in the History of Mathematics, Spring 2016

- **Meeting:** MWF 2:00-2:50, AEB 350
- **Instructor:** Stefan Patrikis, office JWB 309, email patrikis@math.utah.edu
- **Office hours:** Monday 3-4, Wednesday 3-4, held in AEB 350
- **Text:** Victor Katz, *A History of Mathematics* (3rd edition), ISBN 978-0321387004
- **Course Description:** We will survey some of the principal themes in the history of mathematics from antiquity to the early modern world, with some forays into more recent developments as well. This is a vast subject–at all times and all places people have developed mathematics to suit their needs, and sometimes their fancies–so our discussion will necessarily be highly selective; we will aim to give a sense of how the "modern" conception and practice of mathematics has historically emerged, without taking this emergence as inevitable. In the process, we will encounter a range of exciting mathematical ideas, while cultivating some appreciation for how developments in mathematics run alongside their broader intellectual and cultural contexts. Here a conundrum at the heart of our subject quickly presents itself: to what extent are mathematical ideas–both mundane (how to solve a quadratic equation) and sublime (notions of infinity)–historically invariant, and to what extent should they be understood in a particular historical context and embedded in a particular practice of scientific and philosophical communication? At first approximation, we will take the former, ahistorical, perspective, as this is the easiest way to learn some fun and useful math; but we will make some modest attempts at a more contextual understanding as well. (Is this really a "conundrum"? Perhaps more than any other product of human science and culture, mathematical claims seem to have "intrinsic content" separable from their formal expression. But as a teaser, consider the following anecdote: a few years ago, the chair of an elite math department, giving his welcome address to the new class of PhD students, advised them, "We are no smarter than previous generations–we just have better language." What might the implications of this advice be for aspiring researchers?)
- **Course Expectations** This course has dual aims of teaching mathematical content and the history around its development, with a concomitant glut of material. Some of the mathematics will not be easy, and it is crucial that, when reading the textbook, you get in the habit of actively working out the mathematics: draw a picture, do an algebraic calculation, test a special case–do whatever you need to do to build up your understanding until you can put the text aside and explain it to someone else. That said, the Katz textbook contains more mathematical material than we will cover in class, and while I urge you to study the reading carefully, among the mathematical arguments you should prioritize those covered in lecture. Also get in the habit of reading the "References and Notes" section at the end of each chapter, as both the primary and the secondary sources listed there will suggest many possible directions for your final paper. Furthermore, as we will discuss, how the history of mathematics is and has been written is a much more controversial subject than the textbook lets on. I hope this class will help you attend more closely to how, and on what basis, people construct historical narratives–and the record Katz leaves in his "References and Notes" is a fine starting-point.
- **Prerequisites:** C or better in a 1200 or 1300-level math course (or equivalent advanced placement).

- **Requirement Designation:** Upper-division Communication/Writing *and* Physical and Life Science Intellectual Exploration. Please consult with your departmental adviser to confirm how this fits into your program requirements.
- **Coursework and Grading:**
  - Homework (20%): Regular readings, to be completed in time for the corresponding lecture, and a brief weekly written homework consisting of a few mathematical exercises and possibly a short written response to some aspect of the week's discussion. Late homework will not be accepted.
  - Midterm (20%): February 22 (tentative date)
  - Final (30%): April 29. Both the midterm and the final will primarily, but not exclusively, cover the course's mathematical content.
  - Paper (30%): The research paper will be your chance to follow-up on a topic we could only superficially address in class, or to pursue independently a subject that you wish had been included in our syllabus. You will decide your topic in consultation with me, but the main requirement is that you give your curiosity some room to roam. The writing of the paper will be broken up into a series of shorter assignments: details to follow later in the semester.
- **ADA Statement:** The Americans with Disabilities Act requires that reasonable accommodations be provided for students with physical, sensory, cognitive, systemic, learning, and psychiatric disabilities. Please contact me at the *beginning* of the term to discuss any such accommodation for the course.