

Math 300, History of Mathematics
James T. Smith

3 semester units, Spring 2006, 2007, 2009
Prof. Emeritus of Mathematics, San Francisco State University

This course was aimed at junior mathematics majors and secondary-credential candidates; its prerequisite, two semesters of calculus. Gradually retiring, I had switched my main interest to history. Since then I've produced two books and one major article. These were the only times I taught the course. I decided to base 27% + 33% of the grade on two substantial (≥ 12 pp.) term papers, and devote the time necessary to do that right. I did not care much whether I "covered" specific topics in mathematics, ancient or modern. I wanted to lead students into a marvelous world, show them how to investigate it, and how to write good reports on what interested them most. Department policy stressed writing, but not to this extent, since it also specified a list of topics to be "covered". I used my clout to diverge from that policy. Since then the Department has reverted to a more standard syllabus.

The remainder of the course grade included 10% for two class presentations and 30% for four quizzes to ensure that students read the texts. (Performance on quizzes was terrible; it did not reflect the students' ability to do good work of other sorts.)

At the beginning and end of the course I stressed the life and work of Giuseppe Peano. Why? It provides great material for the humanization of mathematics and is relevant to other courses. Peano stemmed from a modest background like my students'. We surveyed what he and they had learned in school, then turned to the history of those subjects and later developments. Peano was responsible for many fine points that they studied in calculus, linear algebra, numerical analysis, real analysis, and logic courses. These appeared when my lectures reached 1885. Peano was involved in famous controversies, and was a professor of linguistics, too: all that makes for fine reading. The required text *Peano*, by the first-class historian Hubert Kennedy, is free!

During most of the course I lectured intermittently on material in Dirk Struik's *Concise History of Mathematics*, also required. I tried to emphasize its controversial, pioneering aspect, because I feel that the social history of mathematics is too often ignored. Interspersed were sessions describing the use of online library catalogs, books, and reviews, and sessions on finding a story to report, on outlining, on citing sources, and on polishing the writing. I explained the referee process in mathematics, using as an example referees' caustic comments on a historical paper that I published in the *Monthly* in 2010.

Enrollment in these three courses was ≈ 15 , ≈ 20 , then = 30. In the last, mathematically naive credential students displaced most majors.

Students chose their own paper topics, with my guidance and approval. (Warning: it is hard to dissuade the most naive from basing their work on grade-school and commercial counterculture sources.) I reviewed the first papers in deep detail, even copyediting professionally when that seemed useful. The second papers, due at semester's end, received the same level of commentary but not the copyediting. They were much improved! Here are some examples:

Newton's circle, especially Wren's reconstruction of London Student: retired contractor
Beppo Levi in Argentina Latino credential candidate
How did von Neumann become interested in game theory? Undergrad math major

This course was expensive: I could not have instructed more than 30 students this way, even teaching just one course! It was the last, and very best, of my career! Its extensive website is still online: <http://math.sfsu.edu/smith/Math300/Math300.htm>.