

MATH 381 Section 1

History of Mathematics

Fall 2011

Instructor: Jonathan Cox
Office: 228 Fenton Hall
Office Phone: 673-3874

Office hours*: 10-11 M W F; 2-3 Tu; 1-2 Th
E-mail: Jonathan.Cox@fredonia.edu
Course Web Page: <http://www.fredonia.edu/faculty/math/JonathanCox/historyofmath/>

* While these are the official office hours, I am available at other times as well. If you want to meet at a time outside of office hours, the safest option is to set up an appointment with me. You can also just drop by any time, but you might want to call or email first to see if I'm there.

Textbook. Victor J. Katz. *A History of Mathematics*, **Brief** Edition. Pearson/Addison-Wesley, 2004.

Materials. A calculator is strongly recommended (scientific and graphing are both fine). A ruler and compass will be useful at times.

Prerequisite. MATH 210 (Mathematical Structures and Proof) with a grade of C- or higher

Catalog Description. Chronological study of the development of mathematics. Emphasis on the solution of selected mathematical problems associated with historical periods.

Course objectives. The purposes of this course for the student include (1) Gaining an appreciation of historically significant mathematical questions, problems, and results, (2) *Understanding how these have influenced development of the mathematical structures, conventions, and theories of today*, (3) Developing a sense of how mathematical thinking and notation have differed across cultures and changed over time, (4) Becoming familiar with the chronology of important mathematical developments and the historical contexts that influenced them, (5) Improving skills in solving problems, writing proofs, and interpreting mathematical writing, and (6) Applying knowledge of past processes, thought patterns, struggles, conceptual difficulties, and developments to inform contemporary teaching of mathematics.

Expected results. Our course web page includes a link to the departmental master syllabus for MATH 381. See the "Objectives" section of this master syllabus for a list of abilities you should expect to develop and concepts you should expect to learn by the end of this course. This is more detailed and extensive than the list of course objectives given above.

Content and Methodology. I envision the major theme of the course to be "The history and development of algebra" (although we will branch into some other areas as well). We will pursue this theme across as wide a span of history as possible. This will necessitate jumping over many topics in order to concentrate on the most relevant and interesting ones in greater depth. Our interaction with the textbook will involve primarily selections from the first ten chapters. We will also augment this material with several other sources outside the textbook. The beginning of most class periods will be made available for discussion of the homework and related questions. Some of the remaining time will be used for presentation of new material via lecture and discussion. Students are encouraged to ask questions and make relevant comments about this material at any time during such presentation. There will also be some quizzes, group activities, and possibly other activities such as free writing.

Readings and Homework. Reading assignments (RA's), usually from the text, and homework assignments (HW's) will be assigned at almost every class meeting. The main goal of the RA's is to raise your awareness of the historical progression of the mathematical concepts and familiarize you with background and context for the historically important problems, since much of class time might be spent working on the problems rather than going into the historical details. Your completion of the readings will be assessed using various means which may include components of quizzes based the readings, email submission of answers to reading questions, and brief writing assignments completed in class or outside of class or online. HW's will not be collected, but will often be discussed in class. The HW problems provide an opportunity to deepen your understanding of concepts as well as valuable practice for problem assignments, quizzes, and exams. You should expect some of the problems (HW and PA) to be challenging and time-consuming. Proofs will play an increasing role as the semester progresses. **In order to be successful, allocate significant effort to the HW and ask questions about homework problems whose solutions continue to elude you after extensive thought.**

Problem Assignments and Other Assignments. Some assignments will be designated as *problem assignments* (PA's); work on these will be graded. Feedback will always be provided on PA's, but some problems might be graded at least partially on completion rather than in full detail for correctness. I recognize the importance of timely feedback on your work, and will endeavor to return all graded material to you within one week.

Some projects (or other special assignments) might also be assigned, collected, and graded. Scores from any such projects will be included in the "Other assignments" category of the grade.

Due dates for graded assignments will be specified, and no late work will receive full credit, except in the case of an excused absence on the due date. (See the **Attendance Policy** section below.) I define work to be *late* if it is handed in, without an excused absence, after 8:30am the day following the due date. Late work can still be handed in and graded, but will receive credit for only 50% of the points earned. However, no late work may be handed in after the last day of class or more than two weeks after the original due date. Each student's lowest PA score for the semester will be dropped.

Quizzes. There will be several announced, in-class quizzes during the semester. A given quiz will sometimes include a section of questions drawn from the RA's assigned since the previous quiz. In this case, during a quiz students may use one 3" by 5" notecard with personally handwritten notes on the relevant reading assignments. Quizzes will also frequently contain problems related to those on the homework assignments or to material discussed in class.

At the instructor's discretion, quizzes missed due to *serious* and *unavoidable* circumstances may be made up for full credit, and quizzes missed for other reasons may be made up for half credit. (If you know in advance that you will be absent, talk to me about the possibility of taking the quiz early.)

Exams. The purpose of the exams is to determine your level of mastery of the *concepts* of the course as well as the procedures. They will test not only your ability to memorize and compute, but also your ability to think. There will be two 75 minute in-class exams and a 120 minute comprehensive final examination. The *approximate* dates of the in-class examinations are October 13 and November 15. Exact dates for these exams will be announced in class at least one week in advance. The final exam will be given on **Monday, December 12, at 1:30pm.**

A make-up exam can be taken if an exam is missed due to *serious* and *unavoidable* circumstances, or in the event of an excused absence, and only if your request to make up an exam is made *in advance of or as soon as reasonably possible after* the exam (and approved by the instructor). Make-up exams should be taken within two class periods following the day of the exam. If these conditions are not satisfied, it is understood that the opportunity to make up the examination is voided.

Grading and Evaluation. Performance in this course will be evaluated on a percentage system. Each of the regular exams will constitute 20% of the final grade. Problem assignments will determine 25% of your grade. Quizzes and any other graded assignments will be combined into one category that accounts for 15% of the grade. The remaining 20% of the grade will be determined by the final exam. At the end of the course, your cumulative average (AVE) will be computed as follows.

$$\begin{aligned} E &= \text{Exam average} \\ F &= \text{Final exam percentage} \\ O &= \text{Average on other assignments (quizzes, projects, etc.)} \\ P &= \text{Problem assignment average} \\ \text{AVE} &= .40E + .20F + .15O + .25P \end{aligned}$$

During the semester, averages will be posted and (somewhat) regularly updated on ANGEL. Letter grades will be assigned as follows based on a student's final percentage:

$$\begin{aligned} 93 \text{ and above} &= A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-; \\ 77-79 &= C+; 73-76 = C; 70-72 = C-; 67-69 = D+; 63-66 = D; 60-62 = D-; \text{ below } 60 = F. \end{aligned}$$

The instructor reserves the right to lower the grade ranges. The grade ranges will not be raised.

Attendance Policy. We will follow the SUNY Fredonia class attendance policy. (See <http://www.fredonia.edu/catalog/3833.htm> in the 2011–2012 University Catalog.) Attendance is crucial to success in this course. You probably won't be able to pass the course if you do not attend regularly. If you must be absent, please notify the instructor beforehand. An attendance sheet will be passed around each time the class meets. **It is your responsibility to sign this sheet** each period in order for your attendance to be official.

Work missed during an absence can be made up if the absence is determined by the instructor to be an *excused absence*. Your absence will be excused if you are participating in a university-sponsored program, exercising religious beliefs, hospitalized, or attending the funeral of a relative. *Other absences due to unavoidable circumstances may also be excused at the discretion of the instructor.* Appropriate documentation related to an absence, provided to the instructor in a timely manner, will greatly aid your case for getting that absence excused.

Withdrawal Policy. The student schedule changes policy for this course will be that of the University. (See <http://www.fredonia.edu/catalog/3826.htm> and <http://www.fredonia.edu/catalog/3849.htm> in the 2011–2012 University Catalog.) **IT IS YOUR RESPONSIBILITY TO KNOW AND COMPLY WITH ALL DEADLINES.** The last day to DROP this course is **Friday, August 26**. The last day to WITHDRAW from this course is **Friday, October 28**. The last day to completely withdraw from the university is **Monday, November 28**.

Special Accommodations. Reasonable accommodations are available to students with documented disabilities at SUNY Fredonia. Students who might require instructional and/or examination accommodations should contact the office of Disability Support Services for Students (DSS), located on the 4th Floor of the Reed Library (716-673-3270 or disability.services@fredonia.edu). The DSS coordinator will review documentation and determine accommodations on a case-by-case basis. DSS will notify the instructor with an accommodation letter which verifies that you have registered with the DSS office and which describes any accommodations approved for you. After you have met with the DSS coordinator, please contact the instructor to discuss any needed accommodations. See also www.fredonia.edu/tlc/DSS/dss.htm.

Academic Dishonesty/Misconduct. Each student is expected to “support and abide by all provisions of the ... Academic Integrity Policy” (<http://www.fredonia.edu/catalog/4442.htm>, 2011–2012 University Catalog). While we will follow this policy, more details are given below regarding the conduct that is expected in this class. Please ask if at any time it is unclear whether some action is or is not allowed.

You are encouraged to work together on homework and in learning the material. While working with another person or in study groups is permitted, **all final work submitted for individual assignments must be your own.** The principle here is simple: *Under no circumstances and in no way should you ever copy any part of anyone else’s work and present it as your own.* Whether discussing hand-in homework with a group, comparing solutions with a friend, or getting help from a tutor, do not take any notes from the discussion away with you—in other words, you can share your thoughts (including, for instance, on paper or a board), but you must walk away with only your understanding. In particular, write solutions up on your own. No collaboration is allowed on exams. In cases where work appears to be copied, I will invite the students involved to my office to explain the relevant material and the situation to me. A student who cannot explain his or her work adequately or who fails to present an explanation will lose points or receive a grade of zero on the assignment in question. Furthermore, a required report of the violation will be sent to the Dean of the College of Arts and Sciences. Ultimately, *in order to be successful in learning the material and preparing for the examinations, you need to try to work out assigned problems yourself as much as possible.*

SUNY Fredonia Counseling Center. LoGrasso Hall; Phone: 673-3424; www.fredonia.edu/counseling
— Services are free and confidential.

Daily schedule. A *tentative* daily schedule for this course is available online at <http://www.fredonia.edu/faculty/math/JonathanCox/historyofmath/sch381s11.pdf> .

Any changes to this syllabus will be communicated in class by the instructor.