

Syllabus
MATH 3010-001 Spring 2014
History of Mathematics (3 credits)
MW 3:05–4:25 PM in LCB 215

Instructor: Jason Underdown
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Office Hour: Mondays and Wednesdays after class & by appointment

Textbook: There is no required textbook for the course. You will only be required to use my lecture notes and a few freely available PDF documents. The campus bookstore probably lists a textbook by Victor Katz as the textbook for this class, but this is *incorrect*. If you bought this textbook you can return it. (However, if you can afford to keep it, you might find it to be a valuable resource when writing your research paper.)

Recommended Books

Title:	Galois Theory for Beginners A Historical Perspective
Author:	Jörg Bewersdorff
ISBN:	978–0–8218–3817–4 (paperback)
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Title:	Galois Theory
Author:	Joseph Rotman
ISBN:	978–0–3879–8541–1 (paperback)
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Title:	Unknown Quantity: A Real and Imaginary History of Algebra
Author:	John Derbyshire
ISBN:	978–0–452–28853–9 (paperback)
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Title:	The Not So Short Guide to L ^A T _E X 2 _ε
Author:	Tobias Oetiker and others
URL:	ctan.math.utah.edu/tex-archive/info/lshort/

Prerequisites: Prerequisites: "C" or better in (MATH 1210 OR MATH 1250 OR MATH 1270 OR MATH 1311 OR MATH 1220 OR MATH 1310 OR MATH 1320 OR MATH 2210) OR AP Calculus AB score of at least 4 OR AP Calculus BC score of at least 3.

Course Objectives: In short, the goal of this course is to give you a glimpse into what mathematics is all about, to help you decide if it is something you wish to pursue at the graduate level.

- Understand the role of proof in mathematics.
- Study Group Theory to see an example of “modern” mathematics.
- Study Historical Equation Theory to see specific examples of how mathematicians build upon each others work.

- Learn the basics of typesetting math in \LaTeX , and how to use this tool to effectively communicate mathematical ideas.

Course Content: This is a writing/history course, but it is not a typical history course. It is about the history of mathematics thus we will focus on the historical development of several important ideas in math. Namely, we will focus on what has been through the years known as Equation Theory. This is the theory of polynomial equations and their solutions. We will trace this development from ancient times up until its successful conclusion in Galois' 1830 paper.

Galois Theory is often taught according to the pattern Emil Artin introduced in the early twentieth century which relies heavily upon ideas from Linear Algebra, but because many students in the class have not yet studied Linear Algebra, we will stick to old fashioned Galois Theory, the way Évariste Galois introduced it.

After finishing Galois Theory, we will discuss two different methods for obtaining the set of real numbers from the set of rational numbers, namely Dedekind cuts and metric space completion. If there is time we will discuss some topics from Linear Algebra.

Since writing mathematics is fundamentally different from writing in other subjects we will use a unique tool, the \LaTeX typesetting system. One of the first things we will cover is how to use \LaTeX to generate high quality, typeset documents. You will be expected to use this tool for homework and your research paper. All written assignments must be typeset via \LaTeX .

Exams: There will be two in-class midterm exams and one final exam. These exams will cover material in the lecture notes.

Quizzes: I'm not planning on giving quizzes, but I reserve the right to change my mind on this.

Homework: Homework will be assigned according to the course schedule. You will usually have one homework assignment per week. Each assignment should take roughly 3-4 hours to complete.

Research Paper: You will be required to write one research paper on the topic of your choice (pending my approval). The paper should be approximately 14 to 20 pages in length. Your paper should explain some piece of mathematics in detail. This usually means providing examples which illustrate the concept or algorithm, etc. under discussion. You must reference at least two books (not just Wikipedia) and cite them correctly. More instructions for writing your research paper will be provided on the course web site.

Grading: Grades will be calculated according to the following scheme:

Assessment	Percentage of Grade
Homework	20%
Research Paper	20%
Midterm Exams	15% each
Final Exam	30%

Grading Scale: The grade scale will be the usual: A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59).

Canvas: I plan to only use Canvas to communicate grades. All other course material will be at the course web site listed above.

ADA Statement: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.