Modern Algebra
MATH 325W – Spring 2015

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Office Hours 2:30PM–4:30PM MWF or by appointment.

Course Overview This course will present the very famous story of the search for formulas, analogous to the quadratic formula, for finding solutions to to higher degree polynomials, e.g. cubics, quartics, and quintics. This search led to the discovery of various (now ubiquitous) mathematical structures. The study of these structures and the way in which they are intertwined is really what this course is about.

Book *Abstract Algebra: A Concrete Introduction*, by Robert Redfield.

Course Components

Homework. Homework will be due each Tuesday and Friday at 4:30PM in the relevant folder outside of my office door. You are *allowed and encouraged* to work together on homework, but you are expected to **write up your solutions on your own**. Solutions must be written clearly, must include all supporting work, and must be professional in appearance.

- (Clarity) I will insist that the grader take off points if the work is not **easy** to follow, even if the solution is correct.
- (Supporting work) I will insist that the grader take off points if the work is not sufficiently justified.
- (Professionalism) I will insist that the grader take off points if the work is not professional in appearance. In particular, do not turn in work on paper torn out of a spiral notebook or work with parts scribbled out.

Writing assignments. These assignments (usually proofs) will be due each Wednesday at 4:30PM in the relevant folder outside of my office door. The writing assignments must be typed up using LATEX. Becoming proficient with LATEX is one of the aims of the course, and we will devote time, in and out of class, to learning this mark-up language. Again, solutions must be written clearly, must include all supporting work, and must be professional in appearance.

- (Clarity and style) I will take off points if the work is not **easy and enjoyable** to read, even if the solution is correct. This is a WI course after all!
- (Supporting work) I will certainly take off points if the work is not sufficiently justified; it's not a proof if you don't prove everything.
- (Professionalism) For the most part, LATEX will take care of this for you.

Follow-up questions. Class will usually begin with a handful of *basic* questions on *previously covered* material being asked to randomly chosen students. The questions will almost always ask for the statement of a definition or recently covered theorem.

Exams: There are 3 midterm exams scheduled for the following evenings:

Exam 1   Monday, February 23, 6:00–7:30PM
Exam 2   Monday, April 6, 6:00–7:30PM
Exam 3   Monday, May 4, 6:00–7:30PM

There will also be a Final Something, e.g. exam or paper. Our final time is Thursday May 14 from 9:00AM–12:00PM.

Grade Composition

Homework	15% (the lowest 2 scores will be dropped)
Writing assignments	20%
Follow-up questions	5%
Midterm exams	15% each
Final	15%

Writing Intensive This is a writing intensive course. Mathematics is deeply concerned with solving old problems, stating new ones, generalizing and abstracting existing theories, and uncovering new connections, but the end product is always a precise, concise, and thorough article. An "advance" in mathematics is nothing until others believe and understand it. One major goal of this course is to improve the students' ability to write logically precise, well-structured, and well-justified mathematics. Supplementing this goal, the course aims to build proficiently in typesetting mathematics with LaTeX.

You will have writing assignments due each week, and at least one third of each assignment's grade will be based on clarity and style. We will discuss these issues both in and outside of the classroom, and you are strongly encouraged to solicit feedback from me on your rough drafts. Revisions to your final drafts will be by invitation only.

Getting Help Mathematics is hard. Try hard. But don't be surprised if that is not always enough. Talk with your classmates. Talk with me. But please try to avoid asking "how do I start." Instead, try to rewrite the problem in a way that is more meaningful to you and then ask, "does my interpretation of the question seem correct." Very often, the act of "simply" reformulating a problem will lead to insight about its answer.

Disabilities Any student with a documented disability needing academic adjustments or accommodations should speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities should contact Allen Harrison in the Dean of Students Office (Elihu Root House; ext. 4021).