

Math 5285H, Fundamental Structures of Algebra I
Fall 2009

Lecturer Tyler Lawson
Office Vincent Hall 323
Phone (612) 625-6802
Email tlawson@math.umn.edu
Office hours M 1:00-2:00, W 2:30-3:30
Course website <http://www.math.umn.edu/~tlawson/5285H/>

Objectives. Review of matrix theory, linear algebra. Vector spaces, linear transformations over abstract fields. Group theory, including normal subgroups, quotient groups, homomorphisms, class equation, Sylow's theorems. Specific examples: permutation groups, symmetry groups of geometric figures, matrix groups.

In English, the goal of this course is to introduce some of the concepts in abstract algebra that play a pivotal role in modern mathematics and its applications to other sciences.

Prerequisites. The prerequisites for this course are a grounding in linear algebra (such as 2243 or 2373 or 2573) and a background in mathematical reasoning (such as from 2283 or 2574 or 3283).

Class time. The lectures for this course are MWF from 10:10 am to 11:00 am in Vincent Hall room 1.

Textbook. The text for this course is *Algebra*, by Michael Artin. You are encouraged to look at other texts, such as Nicholson's *Introduction to abstract algebra*, Gallian's *Contemporary abstract algebra*, Hungerford's *Abstract algebra: an introduction*, Lang's *Algebra*, Hungerford's *Algebra*, or Dummit and Foote's *Abstract algebra*. (Mathematicians are not big on catchy titles.) The process of learning mathematics benefits from looking at multiple perspectives.

Artin's book, as well as Dummit and Foote's, are both on reserve in the math library.

Evaluation. Your grade for this course will consist of the following components.

- Homework 50%, 10% per assignment
- Midterms 30%, 15% per midterm.
- Final exam 20%.

Homework. There be 5 problem sets, and you will have about two weeks to do each of them. Barring unusual circumstances, late homework will not be accepted. Homework will be returned either in-class or (if done so *earlier*) in my mailbox on the main floor of the main building.

Exams. There will be two take-home midterm tests and one take-home final. These will be open-book and open-library, but no other students or outside electronic sources may be consulted. These count equally towards your final grade.

As with homework, exams are due in-class.

Policies on collaboration and cheating. You are allowed (and encouraged) to work with other students while trying to understand the homework problems. However, the homework that you hand in should be your work alone.

As stated above, no consultation with other students are allowed on midterms or the final exam. No consultation of outside electronic sources is permitted.

Important dates.

- October 7: First midterm posted.
- October 14: First midterm due.
- November 11: Second midterm posted.
- November 18: Second midterm due.
- December 9: Final exam posted.
- December 16: Final exam due.