

Math 5286H, Fundamental Structures of Algebra II
Spring 2010

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Objectives. Ring/module theory, including ideals, quotients, homomorphisms, domains (unique factorization, euclidean, principal ideal), fundamental theorem for finitely generated modules over euclidean domains, Jordan canonical form. Introduction to field theory, including finite fields, algebraic/transcendental extensions, Galois theory.

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 background in groups and abstract linear algebra, roughly equivalent to the material covered by Math 5285H.

Class time. The lectures for this course are MWF from 10:10 am to 11:00 am in Vincent Hall room 206.

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.

- Midterms 60%, 20% per midterm.
- Final exam 40%.

Exams. There will be three 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.

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.

- February 5: First midterm posted.
- February 12: First midterm due.
- March 5: Second midterm posted.
- March 12: Second midterm due.
- April 2: Third midterm posted.
- April 9: Third midterm due.
- April 30: Final exam posted.
- May 7: Final exam due.