Math 412: Introduction to Modern Algebra
Section 2

Section 2: 10:00-11:00am MWF @ East Hall 4088
Instructor: Eleonore Faber
Office: East Hall 1855
Email: emfaber@umich.edu
Office Hours: M 11am–1pm, W 12–1pm
Course Webpage: `http://www-personal.umich.edu/~emfaber/teaching.html`
This site has important information regarding homework assignments.
Textbook: *Abstract Algebra, An Introduction* by Thomas W. Hungerford, 3rd edition. I will mostly follow the book but maybe change the order of some topics.

Prerequisites: Familiarity with abstract reasoning and proofs (like Math 217), basics of linear algebra.

Course Description: This class is an introduction to the basic concepts of algebra. The topics covered are approximately Chapters 1–9 in the textbook. The class is roughly structured as follows: in part I arithmetic in $\mathbb{Z}$ will be studied (division algorithm, primes, and unique factorization, congruences in $\mathbb{Z}$, the structure of $\mathbb{Z}_p$ where p is a prime number). Part II is about basic properties of rings and morphisms (ideals, factor rings, arithmetic in the polynomial ring over a field). Finally, in part III we study the basics of group theory (definitions, examples, normal subgroups, quotient groups and isomorphisms, the symmetric group, the structure of finite groups).

Homework: The best way to learn mathematics is by actually doing it. As such, homework will be assigned regularly in this course. Problem sets and deadlines will be posted on the webpage and you are expected to check back regularly. I *strongly* encourage that you work on the problem sets with your classmates, but I insist that each student writes up his/her own solutions to the problems. I trust that you will maintain academic integrity in this regard. Remember that anything you hand in with your name at the top needs to be *your own work in your own words*.

The ultimate step in understanding a concept or solution is to be able to clearly explain it. Moreover, clear exposition of difficult concepts is a skill which is invaluable far beyond mathematics. As such, your homework sets will be evaluated both upon the correctness of your solution and upon the quality of your exposition.

Quizzes: There will be short weekly quizzes. The exact dates will be announced in class and on the webpage. There will be no-make up quizzes, however, I will drop your lowest quiz score.

Exams: There will be one in-class midterm exam and one final exam. The dates of the exams are

- Midterm: February 22, 10:00–11:00am (in class)
- Final: April 25, 1:30–3:30pm

Grades: Final grades will depend upon your performance on homework (20%), quizzes (20%), midterm (25%), and the final (35%).

Special Accommodations: If you need any special accommodations throughout the semester (especially in regards to the exams), please let me know at least two weeks prior.

Disclaimer: I reserve the right to change anything on this syllabus if I feel it will improve the quality of the course. All changes will be announced in class.

Have a great semester!