Algebra I
MATH 621, Fall 2019
MW 4:30-5:45pm, Exploratory Hall 4106,
http://math.gmu.edu/~nepstei2/621f19

Instructor: Dr. Neil Epstein, Associate Professor, Department of Mathematical Sciences, Exploratory Hall 4457, Office Phone: (703) 993-1473

Office Hours: TBA

Textbook: Thomas W. Hungerford, *Algebra*.

I also recommend the books *Algebra*, by Larry C. Grove, and *Algebra: Chapter 0* by Paulo Aluffi.

Prerequisites: Abstract Algebra (Math 321) or equivalent.

Course Content: Most of chapters I-III, along with the first section of chapter V and perhaps some of chapter IV. The order of chapter coverage will be I, III, II, IV, V. This includes a deeper dive into (and a more sophisticated take on) group theory than you have likely seen before, including structure theory and adjacent topics such as monoids and categories. We will also learn some ring theory (e.g. principal ideal domains, unique factorization domains, formal power series, etc.), field theory (esp. the theory of field *extensions*), and possibly module theory (i.e. the action of a ring on an abelian group). Theory, problems, and proofs will all be discussed.

After this course, the student should have a firm basic understanding of abstract algebra, enough to be able to read more advanced algebra texts and some research articles. Also note that this course is designed as preparatory for the algebra preliminary exam, and indeed the final exam at the end will double as such.

Expectations:

- Pay attention in class and do all readings.
- You will do all assigned homework problems. As you know by now, math is best learned by doing.
- If you have any questions, ideas, or comments, you will speak up (but not disruptively).

Grading: There will be two in-class exams (on **Wednesday, October 2** and **Wednesday, November 6**) and a final on **Wednesday, Dec 11**, which will double as the algebra prelim exam as per the new policy. Together, the three exams will comprise 85% of your grade. The other 15% of your grade will come from the homework, which will be assigned roughly weekly.

Collaboration: Healthy discussion about the homework problems among your classmates is allowed and even encouraged. Be sure though, to write your own solutions when turning in the homework.

Attendance and Class Participation: Students are expected to attend classes regularly and participate. Please let me know ahead of time if you plan to be absent and why.