

Math 504A—Modern Algebra

Fall 2024

MWF 10:30, PDL C-38

Instructor: Monty (or William) McGovern, PDL C-450, mcgovern@math.washington.edu

Office Hours: Th 9:30 and by appointment.

Text: *Abstract Algebra*, by Dummit and Foote (3d ed., Wiley, 2004) (recommended).

Prerequisite: Math 40x sequence, the equivalent, or instructor permission.

What to Expect: This is the first quarter of the first-year graduate algebra sequence. I will assume some group theory and begin with group actions on sets, using these to prove the basic results on p -groups and the Sylow Theorems, also giving a beautiful and unexpected application to the classification of finite subgroups of the special orthogonal group $SO(3, \mathbb{R})$. I will conclude group theory with an account of free groups and the Nielsen-Schreier Theorem that every subgroup of a free group is free. I will then move on to modules over rings. Homework will be due every Friday and submitted on Gradescope. The course grade will be based 50% on homework and 50% on a final exam. I will post notes for all lectures on Canvas.