

## INTRODUCTION

This set of notes is designed for a graduate level algebra course at Nicholls State University entitled “Geometric and Algebraic Structures”. They are suitable for a one semester course. The student should have familiarity with logic, set theory, and have theorem-proving experience. An undergraduate course in abstract algebra is not necessary.

We begin by studying permutations. We’ll also explain their relationship to symmetry. We will quickly move to groups, rings, and fields. We’ll study different types of groups, such as permutation groups, symmetric groups, and quotient groups. We will also study various functions between groups, rings, and fields, such as homomorphisms, isomorphisms, and isometries. Finally, as time allows, we will cover group actions on sets. I hope you will enjoy this semester as much as I know I will.