

---

*Contents*

PART ONE  
Noncommutative Algebra 1

CHAPTER 1  
*Definitions and Examples of Groups* 3

CHAPTER 2  
*Subgroups and Cosets* 14

CHAPTER 3  
*Homomorphisms* 30

CHAPTER 4  
*Group Actions* 42

CHAPTER 5  
*The Sylow Theorems and  $p$ -groups* 55

CHAPTER 6  
*Permutation Groups* 70

CHAPTER 7  
*New Groups from Old* 83

CHAPTER 8  
*Solvable and Nilpotent Groups* 99

CHAPTER 9  
*Transfer* 115

CHAPTER 10  
*Operator Groups and Unique Decompositions* 129

CHAPTER 11  
*Module Theory without Rings* 142

CHAPTER 12  
*Rings, Ideals, and Modules* 159

CHAPTER 13  
*Simple Modules and Primitive Rings* 177

CHAPTER 14  
*Artinian Rings and Projective Modules* 194

CHAPTER 15  
*An Introduction to Character Theory* 213

PART TWO  
Commutative Algebra 231

CHAPTER 16

*Polynomial Rings, PIDs, and UFDs* 233

CHAPTER 17

*Field Extensions* 254

CHAPTER 18

*Galois Theory* 274

CHAPTER 19

*Separability and Inseparability* 293

CHAPTER 20

*Cyclotomy and Geometric Constructions* 307

CHAPTER 21

*Finite Fields* 326

CHAPTER 22

*Roots, Radicals, and Real Numbers* 342

CHAPTER 23

*Norms, Traces, and Discriminants* 359

CHAPTER 24

*Transcendental Extensions* 379

CHAPTER 25	
<i>The Artin-Schreier Theorem</i>	401
CHAPTER 26	
<i>Ideal Theory</i>	418
CHAPTER 27	
<i>Noetherian Rings</i>	433
CHAPTER 28	
<i>Integrality</i>	453
CHAPTER 29	
<i>Dedekind Domains</i>	474
CHAPTER 30	
<i>Algebraic Sets and the Nullstellensatz</i>	493
<i>Index</i>	507