
Contents

Preface	ix
Chapter 1. Introduction	1
Chapter 2. Semisimple Rings and Modules	7
§2.1. Basic Notions	7
§2.2. Structure Theorems	9
§2.3. Idempotents and Blocks	21
§2.4. Behavior under Field Extensions	27
§2.5. Theorems of Burnside and Frobenius-Schur	38
Chapter 3. Semisimple Groups Representations	41
§3.1. Examples and General Results	41
§3.2. Representations of Abelian Groups	53
§3.3. Decomposition of the Regular Representation	56
§3.4. Applications of Frobenius's Theorem	59
§3.5. Characters	64
§3.6. Idempotents and their Uses	81
§3.7. Subfields of the Complex Numbers	86
§3.8. Fields of Positive Characteristic	96
Chapter 4. Induced Representations and Applications	99
§4.1. Induced Representations	99

§4.2. Mackey's Theorem	120
§4.3. Permutation Representations	128
§4.4. M -groups	139
§4.5. Theorems of Artin and Brauer	142
§4.6. Degrees of Irreducible Representations	152
Chapter 5. Introduction to Modular Representations	155
Chapter 6. General Rings and Modules	161
§6.1. Jordan-Holder and Krull-Schmidt Theorems	161
§6.2. The Jacobson radical	170
§6.3. Rings of Finite Length	172
§6.4. Finite-dimensional Algebras	181
Chapter 7. Modular Group Representations	187
§7.1. General Results	187
§7.2. Characters and Brauer Characters	193
§7.3. Examples	196
Appendix. Some Useful Results	203
Bibliography	209
Index	211