

---

---

# CONTENTS

---

---

## SECTION I

---

---

### Essential Topics of Kinesiology 1

---

---

- CHAPTER 1** *Getting Started* 3  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 2** *Basic Structure and Function of the Joints* 25  
A. JOSEPH THRELKELD, PT, PHD
- CHAPTER 3** *Muscle: The Ultimate Force Generator in the Body* 41  
DAVID A. BROWN, PT, PHD
- CHAPTER 4** *Biomechanical Principles* 56  
DEBORAH A. NAWOCZENSKI, PT, PHD  
DONALD A. NEUMANN, PT, PHD
- APPENDIX I** 86

## SECTION II

---

---

### Upper Extremity 89

---

---

- CHAPTER 5** *Shoulder Complex* 91  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 6** *Elbow and Forearm Complex* 133  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 7** *Wrist* 172  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 8** *Hand* 194  
DONALD A. NEUMANN, PT, PHD
- APPENDIX II** 242

## SECTION III

---

---

### Axial Skeleton 249

---

---

- CHAPTER 9** *Axial Skeleton: Osteology and Arthrology* 251  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 10** *Axial Skeleton: Muscle and Joint Interactions* 311  
DONALD A. NEUMANN, PT, PHD
- CHAPTER 11** *Kinesiology of Mastication and Ventilation* 352  
DONALD A. NEUMANN, PT, PHD
- APPENDIX III** 381

**SECTION IV**

**Lower Extremity 385**

**CHAPTER 12 Hip 387**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 13 Knee 434**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 14 Ankle and Foot 477**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 15 Kinesiology of Walking 523**  
GUY G. SIMONEAU, PT, PHD, ATC

**APPENDIX IV 570**

**INDEX 577**

**SECTION II**

**Upper Extremity**

89

**CHAPTER 5 Shoulder Complex 91**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 6 Elbow and Forearm Complex 133**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 7 Wrist 172**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 8 Hand 194**  
DONALD A. NEUMANN, PT, PHD

**APPENDIX II 242**

**SECTION III**

**Axial Skeleton**

249

**CHAPTER 9 Axial Skeleton: Osteology and Arthrology 251**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 10 Axial Skeleton: Muscle and Joint Interactions 311**  
DONALD A. NEUMANN, PT, PHD

**CHAPTER 11 Kinesiology of Mastication and Ventilation 352**  
DONALD A. NEUMANN, PT, PHD

**APPENDIX III 381**