

Section 1: Cellular Physiology

1. Principles of Cell and Membrane Function
2. Homeostasis: Volume and Composition of Body Fluid Compartments
3. Signal Transduction, Membrane Receptors, Second Messengers, and Regulation of Gene Expression

Section 2: The Nervous System

4. The Nervous System: Introduction to Cells and Systems
5. Generation and Conduction of Action Potentials
6. Synaptic Transmission
7. The Somatosensory System
8. The Special Senses
9. Organization of Motor Function
10. Higher Functions of the Nervous System
11. The Autonomic Nervous System and Its Central Control

Section 3: Muscle

12. Skeletal Muscle Physiology
13. Cardiac Muscle
14. Smooth Muscle

Section 4: The Cardiovascular System

15. Overview of Circulation
16. Elements of Cardiac Function
17. Properties of the Vasculature
18. Regulation of the Heart and Vasculature

19. Integrated Control of the Cardiovascular System

Section 5: The Respiratory System

20. Structure and Function of the Respiratory System

21. Static Lung and Chest Wall Mechanics

22. Dynamic Lung and Chest Wall Mechanics

23. Ventilation (V.), Perfusion (Q.), and V./Q. Relationships

24. Oxygen and Carbon Dioxide Transport

25. Control of Respiration

26. Nonrespiratory Functions of the Lung

Section 6: Gastrointestinal Physiology

27. Functional Anatomy and General Principles of Regulation in the Gastrointestinal Tract

28. The Cephalic, Oral, and Esophageal Phases of the Integrated Response to a Meal

29. The Gastric Phase of the Integrated Response to a Meal

30. The Small Intestinal Phase of the Integrated Response to a Meal

31. The Colonic Phase of the Integrated Response to a Meal

32. Transport and Metabolic Functions of the Liver

Section 7: The Renal System

33. Elements of Renal Function

34. Solute and Water Transport along the Nephron: Tubular Function

35. Control of Body Fluid Osmolality and Volume

36. Potassium, Calcium, and Phosphate Homeostasis

37. Role of the Kidneys in the Regulation of Acid-Base Balance

Section 8: The Endocrine and Reproductive Systems

38. Introduction to the Endocrine System

39. Hormonal Regulation of Energy Metabolism

40. Hormonal Regulation of Calcium and Phosphate Metabolism

41. The Hypothalamus and Pituitary Gland

42. The Thyroid Gland

43. The Adrenal Glands

44. The Male and Female Reproductive Systems