

## SYLLABUS

### **BIOLOGY 258. Human Anatomy and Physiology II (3+2P) 4 Cr.**

**CATALOG DESCRIPTION:** Physical and chemical operation of the organs and systems of the human body, including endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary and reproductive. Basic concepts of metabolism, energy, fluid and electrolyte balance, heredity, pregnancy and human development.

**Semester Offered:** Fall, Spring, Summer

#### ***Student Learning Outcomes***

*Upon successful completion of San Juan College programs and degrees, students will*

***Learn:*** *actively and independently acquire, apply and adapt skills and knowledge to develop expertise and a broader understanding of the world as lifelong learners.*

***Think:*** *think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.*

***Communicate:*** *exchange ideas and information with clarity and originality in multiple contexts.*

***Integrate:*** *demonstrate proficiency in the use of technologies related to their field of study.*

***Act:*** *act purposefully, reflectively, and respectfully in diverse and complex environments*

#### **GENERAL LEARNING OBJECTIVES**

1. Acquire a functional understanding of the relationship between the anatomical structures of the human body and their physiological function.
2. Appreciate the interrelationships among the various organ systems and their contribution to the health of the individual.
3. Appreciate how knowledge of organ system dysfunction provides a basis for understanding the disease process.

**SPECIFIC LEARNING OUTCOMES****Upon completion of the course, the student will be able to:**

1. Locate and characterize the structures of the major endocrine system organs.
2. Discuss the functions of the endocrine system.
3. Relate the chemical classification of the hormones to the mechanism of action on their target cells.
4. Identify the physiological function of the major hormones
5. Discuss the systems by which hormone levels are regulated. Explain the relationship between the hypothalamus and the pituitary gland.
6. Relate how alterations in the secretion of hormones can affect homeostasis
7. Explain the hormonal response to stress.
8. Identify the formed elements in blood and describe their function.
9. Explain the production of formed elements.
10. Understand the ABO and Rh blood groups and how they are inherited.
11. Arrange the events of homeostasis in the proper order.
12. Understand how the coagulation pathways are affected by certain nutritional deficiencies.
13. Identify the tissue layers in the heart and blood vessels.
14. Locate and name the major external cardiac structures and landmarks.
15. Identify the chambers, valves and other internal structures of the heart. Trace a drop of blood from the inferior vena cava to the aorta.
16. Describe the physiology of cardiac muscle contraction.
17. Illustrate the mechanical events of the cardiac cycle including rhythm of heartbeat, pressure and volume changes, heart sounds and EKG deflections.
18. Explain the regulation of stroke volume, heart rate and blood pressure and volume.
19. Describe the location and function of the electrical conduction system of the heart
20. Analyze the significance of the major deflection, segments, and intervals of the normal ECG.
21. Describe the anatomy and physiologic roles of arteries, capillaries and veins.
22. Locate and name the major blood vessels on drawings, models, and dissection specimens.
23. Compare the system and pulmonary blood circuits.
24. Demonstrate the relationships among blood flow, vascular resistance, and blood pressure.
25. Know the functions of the lymphatic system.
26. Identify the lymph vessels and lymphoid organs on drawings and models.
27. Describe the pattern of lymph flow.
28. Discuss the nonspecific body defenses and the inflammatory response.
29. Assess the roles of the cellular and humoral immune responses in fighting infections.
30. Know the functions of the respiratory system.
31. Locate and name the respiratory system components, including microscopic structures.

32. Evaluate the pressure relationships in the thoracic cavity and demonstrate how they relate to breathing.
33. Employ the gas laws to describe the process of gas exchange in the lungs and tissues.
34. Discuss the transport of carbon dioxide and oxygen in the blood.
35. Explain the effects of exercise and high altitudes on respiration.
36. Discuss the central control of ventilation.
37. Know the functions of the digestive system.
38. Know the gross and microscopic anatomy of the digestive system including accessory organs.
39. Explain the processes of mechanical and chemical digestion.
40. Explain how each of the major nutrient types is absorbed from the GI tract and passed to the body.
41. Explain the first pass effect of the liver. Discuss the role of the liver in maintaining energy homeostasis.
42. Understand the neural and hormonal regulation of digestion.
43. Discuss the factors involved in energy balance.
44. Diagram cellular respiration. Indicate how carbohydrates, proteins and lipids enter into this process. Explain the need for oxygen in cell metabolism.
45. Discuss the processes involved in thermoregulation including central control mechanisms.
46. Know the functions of the urinary system.
47. Describe the gross and microscopic anatomy of the organs of the renal system.
48. Name and indicate the function of the parts of the nephron.
49. Diagram the blood supply to the kidney and nephron.
50. Describe the process of glomerular filtration. Explain how this is affected by changes in blood pressure.
51. Describe how nephron tubular mechanisms lead to urine formation, concentration and composition.
52. Discuss the hormonal controls of urine production.
53. Describe the process of micturation.
54. Explain the renal role in fluid balance and blood pressure regulation.
55. Explain the relationship of the nervous system, hormonal system, renal system and cardiovascular system in the control of blood pressure.
56. Discuss how water balances, electrolyte concentrations and pH in body fluids are regulated.
57. Describe the fluid compartments of the body. Know the volume and solute concentrations of each compartment.
58. List the major buffer systems and explain how they help to control the pH of the body.
59. Describe the role of the respiratory and renal systems in pH regulation.
60. Know the roles of the reproductive systems.
61. Describe the gross and microscopic anatomy of the male and female reproductive systems.
62. Describe the formation of gametes in males and females.

63. Discuss puberty and the climacteric in the male and female. Explain the role of hormones in each of these events.
64. Compare and contrast the uterine and ovarian cycles and their endocrine control.
65. Describe the process of fertilization and development of the early embryo.
66. Explain the hormonal changes in the pregnant female.
67. Describe the physiologic effects of pregnancy on the mother.
68. Describe the stages of birth.
69. Explain the cardiovascular and respiratory adjustments to extrauterine life.
70. Discuss the role of the mammary gland and milk production.
71. Introduction to human genetics and patterns of inheritance.

Syllabus developed by \_\_\_\_\_ Date: \_\_\_\_\_

Syllabus reviewed by \_\_\_\_\_ Date: \_\_\_\_\_