

**PALM BEACH COMMUNITY COLLEGE**  
**Course Outline**

**Course Number and Title**

BSC 2086: ANATOMY & PHYSIOLOGY II &

**Catalog Description**

A continuation of BSC 1085. The circulatory, endocrine, reproductive, excretory, digestive and respiratory systems of the body are studied. The laboratory includes demonstrations of human cadaver dissection when possible. Laboratory to accompany BSC 2086.

**Credit and Contact Hours**

BSC 2086: 3-0-3

**Transferability**

No

**Prerequisites**

BSC 2085/L

**Co-requisites**

BSC 2086L

**Textbook and/or Bibliography**

BSC 1086: Human Anatomy and Physiology  
by Solomon and Davis (required)

BSC 1086L: Laboratory Textbook in Anatomy and Physiology  
by Malone and Schneider (required)  
A Guide to Anatomy & Physiology Lab, 2nd ed.  
by Rust (suggested)

**Course Core Objectives** (for APB 1812 & APB 1812L)

1. List in sequence each structure through which food passes as it makes its way through the alimentary canal.
2. Describe the following steps in processing food: ingestion, digestion, absorption and elimination.
3. Identify and describe the four layers of the wall of the GI tract.
4. Distinguish between the visceral and parietal peritoneums and their major folds.
5. Describe the processes of mechanical and chemical digestion that food undergoes in each of the organs and the GI tract.
6. Describe the structures of the mouth and give their functions.
7. Identify and describe the parts of a tooth.

8. Describe the gross and microscopic structure of the esophagus.
9. Describe the gross and microscopic structure of the stomach.
10. Describe the gross and microscopic structure of the small and large intestines.
11. Describe the anatomical features of the small intestine that increase its surface area.
12. Describe the structure of the pancreas and give the functions of its digestive enzymes.
13. Describe the gross and microscopic structure of the liver.
14. Describe the digestive and metabolic functions of the liver.
15. Describe the function of the gall bladder.
16. Describe the role of secretin and CCK-PZ in regulating secretion of bile and pancreatic juice.
17. Summarize chemical digestion of carbohydrates, lipids and proteins in a step-by-step fashion, indicating the location of each reaction, the name of the enzyme and the breakdown products.
18. Describe the structure of a villus and identify its parts.
19. Describe the location and processes by which materials are absorbed in the digestive tract and the use of each in the body.
20. Label a diagram of the digestive system and its parts.
21. Describe the structure and main functions of the nasal cavity and the paranasal sinuses.
22. Describe the structure and functions of the pharynx and larynx.
23. Describe the structure and functions of the trachea and bronchi.
24. Describe the structure of the lung and the functions of alveoli in gas exchange.
25. Summarize the concepts of partial pressures of gases in mixtures.
26. Describe the role of hemoglobin in the transport of oxygen.
27. Describe the vascular transport of carbon dioxide.
28. Describe what happens to oxygen levels in the body at different altitudes or barometric pressures.
29. Summarize the mechanics of breathing.
29. Summarize the mechanics of breathing.
30. Describe the clinical measurements of respiratory function.
31. Summarize the neural control of respiration in relation to blood pH, levels carbon dioxide

and oxygen in the blood and inflation of the lungs.

32. Describe the causes and the effects of hyperventilation and hypoventilation and respiratory acidosis/alkalosis.
33. Trace the path of air through the main structures of the respiratory system and summarize the changes it undergoes.
34. List the functions of the circulatory system that help to maintain homeostasis.
35. Discuss the characteristics of blood (volume, composition, pH).
36. Give the composition of blood plasma and describe the functions of the plasma proteins.
37. Describe the structure, function and production of erythrocytes, leukocytes and thrombocytes.
38. Describe the role of erythropoietin in the regulation of red blood cell production.
39. Describe common blood disorders.
40. Identify and describe the function of the types of leukocytes.
41. Summarize the events leading to formation of a blood clot.
42. Explain ABO and RH blood types and give the antigen and antibody associated with each blood group.
43. Locate the heart in the mediastinum.
44. Describe the structure of the pericardium, epicardium, myocardium and endocardium.
45. Identify and compare the chambers of the heart.
46. Locate and compare the atrioventricular and semilunar valves and describe their function.
47. Trace the conduction system of the heart.
48. Describe the events of the cardiac cycle.
49. Explain the pressure changes that occur during the cardiac cycle.
50. Define cardiac output and identify the factors that determine it.
51. Explain the regulation of heart rate by the nervous system and other factors.
52. Relate Starling's law of the heart to cardiac output.
53. Identify the factors that affect stroke volume.
54. Compare the structure and functions of arteries, arterioles, capillaries, sinusoids, venules and veins.
55. Describe the three layers of the blood vessel wall.

56. Explain the importance of vasodilation and vasoconstriction.
57. Trace the pulmonary and systemic circulation listing the principal vessels and heart chambers.
58. Identify the aorta and its principal branches.
59. Describe the hepatic portal system and its significance.
60. Define blood pressure and give its relationship to blood flow and peripheral resistance.
61. Describe the homeostatic mechanisms that regulate blood pressure and explain why it is important that the blood pressure is lower in pulmonary circulation than in systemic circulation.
62. Explain how blood pressure is measured clinically.
63. Give the physiological basis for circulatory shock and describe the homeostatic mechanisms that compensate for it.
64. List and describe important cardiovascular disorders such as hypertension, arteriosclerosis, coronary occlusion and MI.
65. List the principal functions of the lymphatic system.
66. Identify the main structures of the lymphatic system and trace lymphatic circulation.
67. Describe the structure, function and location of lymph nodules, lymph nodes, the tonsils, the spleen and the thymus.
68. Locate the major groups of lymph nodes in the body.
69. Describe the relationship between plasma, interstitial fluid and lymph and contrast differences in composition.
70. Describe the formation of lymph and the lymphatic pump.
71. Describe the location and gross anatomy of the kidney.
72. Describe the function of the kidney and its major parts.
73. Describe the differences between cortical and juxtamedullary nephrons in relation to size, location, blood supply and function.
74. Describe the role of the glomerulus and Bowman's capsule in filtration.
75. Describe the role of the nephron's system of tubules in the concentration, reabsorption and secretion of substances such as water, sodium, urea and glucose.
76. Describe the role of the sodium pump in the reabsorption of sodium and water in the kidney and the effect of ADH and aldosterone on water, sodium and potassium absorption/secretion by the kidney.
77. Describe clinical tests for urine characteristics.

78. Describe the structure, location and function of the ureters, urinary bladder and urethra including variations in men and women.
79. Describe the urethral sphincter and the micturition reflex.
80. Describe the principal functions of water and dissolved electrolytes in the body.
81. Summarize the compartmentalization of body fluids.
82. Summarize the principal routes of intake and loss for water and electrolytes and the homeostatic mechanism affecting water and electrolyte balance and transfers between compartments
83. Describe the regulation of body fluid pH by buffers, pulmonary and renal actions.
84. Distinguish between endocrine and exocrine glands.
85. Define the term hormone and tell what hormones do.
86. Identify the principal endocrine glands their locations.
87. Describe how hormones are transported and the relationship to their target organs.
88. Describe the negative feedback regulation of endocrine glands.
89. Identify the hormones released by each of the endocrine glands (and their parts) and describe their actions.
90. Identify the structures of the male and female reproductive systems on preserved specimens and/or models.
91. Describe the role of meiosis (spermatogenesis and oogenesis), fertilization and mitosis in the human life cycle.
92. Trace the path of sperm from the seminiferous tubules through the male UG tract, describing changes that occur along the way.
93. Describe the source and composition of semen.
94. Trace the development of an ovum from a primary follicle cell to an embryo implanted in the endometrium including its path through the female reproductive system.
95. Describe the development of an embryo from a zygote to a gastrula.
96. List the structures that develop from each germ layer.
97. Describe the fetal circulation and the changes that take place in the cardiovascular system at birth.

## **Course Core Outline**

### TOPIC

- I. Digestive system

- A. Digestive anatomy - organization and general function.
  - B. Mechanical digestion
  - C. Chemical digestion
  - D. Assimilation, absorption and metabolism.
  - E. Nutritional principles
- II. Circulatory system
- A. Cardiovascular system - organization and function.
    - 1. Blood - plasma and formed elements
    - 2. Heart anatomy and physiology
    - 3. Vessel anatomy and physiology
    - 4. Cardiovascular potpourri - blood pressure, blood flow, cardiac output, congestive heart failure.
  - B. Lymphatic system - organization and function
    - 1. Lymph
    - 2. Lymphatic vessels
    - 3. Lymph nodes and nodules
    - 4. Spleen, thymus gland and tonsils
- III. Respiratory system
- A. Respiratory anatomy - organization and general function.
  - B. Respiratory physiology
  - C. Gas transport and exchange
- IV. Urinary system
- A. Urinary anatomy - organization and general function.
  - B. Urinary physiology
- V. Fluid/electrolyte and pH homeostasis
- VI. Endocrine system

## DIGESTIVE SYSTEM

- 1. Mesenteries, ligaments and omenta
- 2. Digestive viscera - cat and human
- 3. Digestive enzyme experiments

## CIRCULATORY SYSTEM

- 4. Blood
- 5. Heart and its circulation
- 6. Arterial dissection (upper body)
- 7. Arterial dissection (lower body)
- 8. Midterm Practical Exam
- 9. Veins/lymphatics dissection
- 10. Respiratory system

## URINARY AND REPRODUCTIVE SYSTEMS

- 11. Physiology of the urinary system
- 12. Urinary/reproductive anatomy (cat)
- 13. Urinary/reproductive anatomy - human

14. Reproduction & development

**Special Requirements**

None.

Created 10/14/96