SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: BIOL 232 Department: Biological Sciences

Course Title: Anatomy & Physiology 2 Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Understands that the autonomic nervous system maintains homeostasis.	1. Describe the functions of the autonomic nervous system. 2. Distinguish between the sympathetic and parasympathetic divisions of the autonomic nervous system.
2. Understands that receptors detect changes occurring inside and outside the body.	1. Name five kinds of receptors and explain the function of each kind. 2. Explain how a sensation is produced. 3. Describe the somatic senses. 4. Describe the receptors associated with the senses of touch, pressure, temperature, and pain. 5. Describe how the sense of pain is produced. 6. Explain the relationship between the senses of smell and taste. 7. Name the parts of the ear, and explain the function of each part. 8. Distinguish between static and dynamic equilibrium. 9. Name the parts of the eye, and explain the function of each part.

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	10. Explain how light is refracted by the eye. 11. Describe the visual pathway.
3. Understands that the endocrine system communicates with the nervous system and adjusts to changing needs of the body.	1. Distinguish between endocrine and exocrine glands. 2. Explain how steroid and nonsteroid hormones produce effects on target cells. 3. Discuss how hormonal secretions are regulated by negative feedback mechanisms. 4. Explain how hormonal secretions may be controlled by the nervous system. 5. Name and describe the location of the major endocrine glands, and list the hormones they secrete. 6. Describe the general functions of the hormones secreted by endocrine glands. 7. Explain how the secretion of each hormone is regulated.
4. Understand that the blood is a link between the body's internal parts and its external environment.	1. Describe the general characteristics of the blood and discuss its major functions. 2. Distinguish between the various types of cells found in blood. 3. Explain how red cell production is controlled. 4. List the major components of blood plasma, and describe the functions of each. 5. Review the major steps in blood coagulation. 6. Explain the basis for blood typing.
5. Understand that the cardiovascular system includes the heart and blood vessels.	1. Name and describe the major parts of the heart, and discuss the function of each part.

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	2. Trace the pathway of the blood through the heart and vessels of the coronary circulation. 3. Discuss the cardiac cycle, and explain how it is controlled. 4. Identify the parts of a normal ECG pattern, and discuss the significance of this pattern. 5. Compare the structures and functions of the major types of blood vessels. 6. Describe the mechanisms that aid in returning venous blood to the heart. 7. Explain how blood pressure is produced and controlled. 8. Compare the pulmonary and systemic circuits of the cardiovascular system. 9. Identify and locate the major arteries and veins of the pulmonary and systemic circuits.
6. Understands that the lymphatic system helps prevent fluid from accumulating in tissue spaces and protects against disease-causing agents.	1. Describe the general functions of the lymphatic system. 2. Describe the location of major lymphatic pathways. 3. Describe how tissue fluid and lymph are formed, and explain the function of lymph. 4. Explain how lymphatic circulation is maintained. 5. Describe a lymph node and its major function. 6. Discuss the functions of the thymus and spleen. 7. Distinguish between specific and nonspecific immunity, provide examples of each. 8. Explain how two major types of lymphocytes are formed, and explain how they function in immune response. 9. Name the major types of immunoglobulins, and discuss

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	their origins and actions.
7. Understand the structure and function of the respiratory system.	1. List the general functions of the respiratory system. 2. Name and describe the locations of the organs of the respiratory system. 3. Describe the functions of each organ of the respiratory system. 4. Explain how inspiration and expiration are accomplished. 5. Name and define each of the respiratory air volumes and capacities. 6. Locate the respiratory center, and explain how it controls normal breathing. 7. Discuss how various factors affect the respiratory center. 8. Describe the structure and functions of the respiratory membrane. 9. Explain how oxygen and carbon dioxide are exchanged between the air and the blood and how these gases are transported in the blood.
8. Understands that the endocrine system works with the nervous system to control body activities and maintain homeostasis.	1. Distinguish between endocrine and exocrine glands. 2. Explain how steroid and nonsteroid hormones produce effects on target cells. 3. Discuss how hormonal secretions are regulated by negative feedback mechanisms. 4. Explain how hormonal secretions may be controlled by the nervous system. 5. Name and describe the location of the major endocrine glands, and list the hormones they secrete.

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	6. Describe the general functions of the hormones secreted by endocrine glands. 7. Explain how the secretion of each hormone is regulated.
9. Understands that the digestive system processes molecules so that they can be absorbed and transported to cells.	1. Name and describe the locations of the digestive system organs and their major parts. 2. Describe the general functions of each digestive organ and of the liver. 3. Describe the structure of the alimentary canal wall. 4. Explain how the contents of the alimentary canal are mixed and moved. 5. Describe the swallowing mechanism. 6. List the enzymes secreted by the various digestive organs and describe the function of enzyme. 7. Describe how the digestive secretions are regulated. 8. Explain how the products of digestion are absorbed. 9. Describe the defecation reflex.
10. Understands that cellular metabolism occurs within cells.	1. Define anabolic and catabolic metabolism. 2. Explain how enzymes control metabolic processes. 3. Explain how chemical energy is released by respiratory processes. 4. Describe how energy is made available for cellular activities. 5. Describe the general metabolic pathways of carbohydrates, lipids, and proteins.
11. Understands that the renal system helps to maintain homeostasis of the body.	1. Name the organs of the urinary system, and list their

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	general functions. 2. Describe the location of the kidneys and the structure of a kidney. 3. List the functions of the kidneys. 4. Trace the pathway of the blood through the major vessels within a kidney. 5. Describe a nephron, and explain the functions of its parts. 6. Explain how the glomerular filtrate is produced, and describe its composition. 7. Explain how various factors affect the rate of glomerular filtration, and explain how this rate is regulated. 8. Discuss the role of tubular reabsorption in urine formation. 9. Define tubular secretion, and explain its role in urine formation. 10. Describe the structure of the ureters, urinary bladder, and urethra. 11. Discuss the process of micturition, and explain how it is controlled.
12. Understands that cell function and survival depend upon homeostasis.	1. Explain what is meant by water and electrolyte balance, and discuss the importance of this balance. 2. Describe how the body fluids are distributed within compartments, how the fluid composition differs between compartments, and how the fluids move from one compartment to another. 3. List the routes by which water enters and leaves the body, and explain how water input and output are regulated.

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	4. Explain how electrolytes enter and leave the body, and explain how the input and output of electrolytes are regulated. 5. List the major sources of hydrogen ions in the body. 6. Distinguish between strong and weak acids and bases. 7. Explain how changing pH values of the body fluids are minimized by chemical buffer systems, the respiratory center, and the kidneys.
13. Understands that reproduction is vital to the continuation of the human species.	1. Name the parts of the male reproductive system, and describe the general functions of each part. 2. Describe the structure of a testis, and explain how sperm cells are formed. 3. Trace the path followed by sperm cells from the site of their formation to the outside. 4. Explain how hormones control the activities of the male reproductive organs. 5. Name the parts of the female reproductive system, and describe the general functions of each part. 6. Describe the structure of an ovary, and explain how egg cells and follicles are formed. 7. Trace the path followed by an egg cell after ovulation. 8. Describe how hormones control the activities of the female reproductive system. 9. Describe the major events that occur during a menstrual cycle.
14. Understands that pregnancy, growth, and development are important to giving rise to an adult of the subsequent	10. Review the structure of the mammary gland.

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generation.	1. Distinguish between growth and development. 2. Define pregnancy and describe the process of fertilization. 3. Describe the major events that occur during the period of cleavage. 4. Describe the hormonal changes that occur in the maternal body during pregnancy. 5. Describe how the primary germ layers originate, and list the major structures produced by each layer. 6. Describe the formation and function of the placenta. 7. Define fetus and describe the major events that occur during the fetal stage of development 8. Trace the path of blood through the fetal circulatory system. 9. Describe the birth process, and explain the role of hormones in the process. 10. Describe the major circulatory and physiological adjustments that occur in the newborn.