



South Central College

BIOL 235 Anatomy and Physiology II

Course Outcome Summary

Course Information

Description	Anatomy and Physiology II is an introduction to the structure and function of the human body under normal and abnormal conditions. It is the second in a two course series. It will cover the autonomic, endocrine, immune, respiratory, digestive urinary and reproductive systems. It will also cover fluid electrolyte, acid-base balance, blood, blood pressure regulation and functional characteristics of the heart, special senses, development and inheritance. This course also has a lab component in which students will perform hands on activities to test some of the theories taught in lecture. This course is designed for those students preparing for careers in health-related fields. (Prerequisite- BIOL 225- Anatomy and Physiology I) (MNTC 3)
Total Credits	4
Total Hours	80

Types of Instruction

Instruction Type	Credits/Hours
Lecture	3
Lab	1

Pre/Corequisites

Completion of Anatomy and Physiology I - BIOL225

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Describe sensory pathways and the somatic nervous system

Learning Objectives

Identify the components of afferent and efferent divisions of the nervous system

Explain how receptors respond to specific stimuli and how the organization of the receptor affects its sensitivity

Describe the somatic motor pathways and the levels of motor control

2. Describe the autonomic nervous system

Learning Objectives

Compare and contrast the sympathetic and parasympathetic branches
Explain the mechanism of neurotransmitter release and their affect of target organs and tissues.
Discuss the significance of dual innervation and autonomic tone

3. Explain aspects of higher order functions of the central nervous system

Learning Objectives

Explain how memories are created, stored and retrieved
Distinguish among the levels of consciousness

4. Describe the mechanisms involved in processing sensory information

Learning Objectives

Identify and describe the functions of the hormones produced by the kidneys, heart, thymus, testes, ovaries and adipose tissue
Identify the structures and functions of the eye and ear
Explain the physiological mechanisms involved in hearing, seeing and equilibrium

5. Explain how the endocrine system helps regulate body function

Learning Objectives

Explain the general mechanisms of hormonal action on target tissues
List and describe the hormones of the hypothalamus
Describe the relationship between the pituitary and the hypothalamus
List and describe the function of the hormones produced by the pituitary, pineal gland and pancreas
Discuss the effects of abnormal pancreatic hormone production
List and describe the functions of hormones produced by the kidneys, heart, thymus, testes, ovaries and adipose tissue

6. Describe the components and major functions of blood

Learning Objectives

Describe the composition and functions of plasma
Explain the lifecycle and functions of red blood cells
Explain blood typing and the basis for ABO and Rh incompatibilities
Describe hemostasis

7. Describe the functional characteristics of the heart

Learning Objectives

Review the structures of the heart
Differentiate between contractile and pacemaker action potentials
Explain Frank-Starlings law, automaticity and why there is no summation and no recruitment
Identify the electrical events that are recorded on an electrocardiogram
Define cardiac output and describe factors that influence heart rate and stroke volume

8. Explain the mechanisms that regulate blood flow through vessels

Learning Objectives

Identify factors that influence blood pressure
Describe long and short term regulation of mean arterial pressure
Identify the Starlings forces of the capillaries and the role they play in filtration and absorption
Predict how stressors will affect mean arterial pressure and the compensatory changes the body will make
Describe the relationship between vasoconstriction, mean arterial pressure and peripheral blood flow

9. Distinguish between specific and nonspecific immune defenses

Learning Objectives

Describe the mechanisms of nonspecific immunity
Compare cell mediated and humoral immunity
Discuss the types of T-cells and their roles in the immune response
Discuss the mechanisms of B-cell activation and differentiation
Describe the functions of antibodies including the primary and secondary responses to antigen exposure
Describe and give examples of immune disorders

Explain the effect stress has on the immune system

10. Describe the respiratory system

Learning Objectives

Identify the structures of the respiratory system

Explain the mechanics of breathing

Describe gas transport between the lungs and the tissues

Describe the function and structure of hemoglobin

Explain neural regulation of respiration and how certain factors affect breathing rate and depth

11. Describe the digestive system

Learning Objectives

Identify organs of the digestive system and list their major functions

Describe the functional histology of the digestive tract

Outline the mechanisms that regulate digestion

Describe the structures, functions and regulation of accessory organs

Identify the regional areas in the small and large intestine for nutrient absorption

Describe the mechanisms of digestion and absorption of fats, carbohydrates and proteins

12. Explain the process of metabolism

Learning Objectives

Describe the steps in cell respiration and the energy yields in each step

Summarize the main processes of lipid and protein metabolism

13. Explain the urinary system

Learning Objectives

Locate the major structures in the urinary system and discuss their functions

Discuss transport along the different segments of the nephron tubule

Describe the process of urine formation

Explain the hormonal influence of the volume and concentration of urine

Identify normal constituents of urine

Analyze urine samples and make diagnoses based on test results

Discuss the process of urination including the micturition reflex

14. Discuss fluid, electrolyte, and acid--base balance

Learning Objectives

Explain how fluid, electrolyte and acid-base balance is important for homeostasis

Identify hormones involved in fluid and electrolyte regulation

Identify how hydrostatic and osmotic pressures regulate water and electrolyte movement

Discuss mechanisms for maintaining ion and electrolyte balance

Describe the compensatory mechanisms involved in acid-base balance maintenance

Identify common causes for acid-base imbalances and the mechanisms for correcting the imbalances

15. Describe the reproductive system

Learning Objectives

Identify the structures of the male and female reproductive systems

Discuss the process of gametogenesis

Identify the reproductive hormones, their origins and their functions

Summarize the hormonal regulation of the uterine and ovarian cycles

Discuss the physiology of sexual intercourse in males and females

Describe the reproductive system changes that occur with age

16. Explain aspects of human development

Learning Objectives

Identify the stages of development

Describe the process of fertilization

Explain how developmental processes are regulated

Explain how the three germ layers help form the extraembryonic membranes

Discuss the importance of the placenta

Discuss the structural and functional changes of the uterus during pregnancy
List and describe the events that occur during labor and delivery

17. Relate basic principles of genetics to the inheritance of human traits

Learning Objectives

Define common genetics terms
Identify and describe inheritance patterns
Predict genotypic and phenotypic ratios using a Punnet square
Become proficient at reading human karyotypes

18. Demonstrate safe laboratory practices

Learning Objectives

Be aware of any hazardous materials in the lab
Handle chemicals and equipment in a safe manner

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

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