

**SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES**

Sciences

Revision Date: 07-01-23

I. CATALOG DESCRIPTION

Course Number: BIOS2130

Course Title: Human Physiology

Prerequisite(s): Recommended: Grade of C or higher in ENGL0960 or appropriate placement score for ENGL0985

Recommended: Grade of C or higher in MATH0950 or B or higher in MATH0951 or appropriate placement score for MATH1100

Catalog Description: Functions and homeostasis of the following human body systems: nervous, endocrine, digestive, respiratory, cardiovascular, skeletal, muscular, urinary, reproductive and immune systems. Provide engaging laboratory experimental opportunities that reinforce lecture content. This course is for nursing and allied health majors. Lab is concurrent with lecture and is required.

Credit Hours: 4.0

Class Hours: 45

Lab Hours: 30

Total Contact Hours: 75

II. COURSE OBJECTIVES: *Course will:*

- A. Facilitate student exploration of the organization and biochemistry of the human body, from the cellular to the organismal level.
- B. Explain homeostasis and how it applies to the nervous, endocrine, cardiovascular, digestive, skeletal, muscular, urinary, reproductive, and immune systems.
- C. Explain basic chemistry concepts and organic molecules and how they relate to the human body.
- D. Explore the structure and function of cells including cellular transport mechanisms.
- E. Investigate chemical messengers of the human body and how they maintain homeostasis.
- F. Interpret the functionality of the various blood components.
- G. Explain how macromolecules are digested and metabolized for use, storage, or energy.
- H. Describe the function of the cardiovascular and respiratory systems.
- I. Explore structure and function of skeletal muscles.
- J. Relate the dynamics of fluid, electrolyte and pH balance to organ systems and homeostasis.
- K. Investigate the function of the male and female reproductive systems.
- L. Provide engaging laboratory experimental opportunities that reinforce lecture content.
- M. Be able to retain and relate physiology knowledge for success in future healthcare courses and careers.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes: *Student will be able to:*

- 1. Describe negative and positive homeostatic mechanisms.
- 2. Interpret information from the periodic table and apply to chemical reactions in the body.
- 3. Explain the basic biochemical activities of human body cells, tissues, and organs.
- 4. Explore the cellular structures and their functions and explain the cell cycle and cell cycle regulation.
- 5. Describe different mechanisms of cellular transport.
- 6. Examine the structure and function of a neuron and the process of producing and sending an impulse.

7. Discuss and explain physiology of the endocrine system.
 8. Explain physiology of the cardiovascular system and blood components including blood typing, blood donation, and hemostasis.
 9. Explore the physiology of the digestive system.
 10. Describe the chemical process of metabolism in energy transfer and ATP production.
 11. Explore external and internal respiration as it relates to metabolism and the respiratory system.
 12. Understand and be able to explain the function of skeletal muscle tissue, including the mechanism of muscle contraction.
 13. Explain the function of the urinary system and investigate the roles of fluids, electrolytes, and pH balance in maintaining body homeostasis.
 14. Explore the functions of the male and female reproductive system.
 15. Investigate the events of the innate and adaptive immunity and determine how the body responds to pathogens.
 16. Analyze and apply information from clinical tests to identify potential disease states in relation to the topics covered in this course.
 17. Use a microscope to identify body tissues, organs, cells, and cell features.
- B. General Education Learning Outcomes**
1. GELO #3: Critical Thinking & Problem Solving
 - Outcome 1: Collect, identify, interpret and analyze data.
 - Outcome 2: Synthesize information to arrive at reasoned solutions to problems.
 - Outcome 3: Evaluate ideas presented in writing, media, speech, or artistic presentations.
 - Outcome 4: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.
 - Outcome 5: Acquire and integrate knowledge and construct relationships across disciplines.
 2. GELO #5: Analytical, Quantitative, and Scientific Reasoning
 - Outcome 1: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
 - Outcome 2: Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.
 - Outcome 3: Develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.
 - Outcome 4: Manipulate formulas, data, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Homeostasis
- B. Inorganic and Organic Chemistry as it relates to physiology
- C. Cellular Structures and Functions
- D. Cellular Transport
- E. Cell Replication and Regulation
- F. Nerve Structures and Functions
- G. Endocrine System
- H. Blood Components
- I. Blood Typing and Blood Donation
- J. Hemostasis
- K. Digestive System

- L. Metabolism
- M. Respiratory System
- N. Cardiovascular System
- O. Skeletal Muscle Contraction
- P. Urinary System
- Q. Reproductive System
- R. Immune System

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 1. Martini, Frederick, Judi Nath, & Edwin Bartholomew, *Fundamentals of Anatomy and Physiology*, 11th ed., Pearson, 2018. ISBN: 978-0-13-439602.
 2. Bassett, Steven, E., *Human Physiology Workbook*, 1st ed., Bluedoor, 2020. ISBN: 978-1-64386-336-8.
 3. Bassett, Steven, E., *Human Physiology Laboratory Manual*, 2nd ed., Hayden-McNeil, 2022. ISBN: 978-1-5339-9310-9.

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 1. Lecture
 2. Laboratory experiments and activities
 3. Discussion
 4. Supplemental learning objects, such as: animations/videos, demonstrations, companion internet site access, and in-class activities

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 1. Exams
 2. Quizzes
 3. Topic Homework
 4. Projects/Presentations
 5. Writing Assignments
 6. Online Activities

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		