



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**Anatomy & Physiology Enhancement
BIO4151 1 Credit Hours**

Student Level:

This course is open to students on the college level in either the freshman or sophomore year.

Catalog Description of the Course:

BIO 4151 - ANATOMY AND PHYSIOLOGY ENHANCEMENT (N) (1 hr)

This course provides for an elaboration of either the anatomy or the physiology of foundation topics presented in BIO4150 Human Anatomy and Physiology. Topics can include cell structure and function, muscular system, nervous system, endocrine system, immune system, cardiovascular system, respiratory system, digestive systems and/or urogenital system. This course is graded on a pass/fail scale and no letter grade will be given.

Prerequisites:

BIO4150 Human Anatomy and Physiology or an equivalent 5 credit hour course.

Controlling Purpose:

Anatomy and Physiology Enhancement provides the student with a concise elaboration of details related to specific topics requiring additional learning development as previously presented in Anatomy and Physiology. This course is graded on a pass/fail scale and no letter grade will be given.

Learner Outcomes:

Upon completion of this course students will have an understanding of the scientific theories and concepts and their impact on intellectual thought and social systems. They will be able to apply the scientific method/process and scientific principles in both classroom and laboratory activities and will be able to employ reading, writing and critical thinking skills.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.

- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: CELL BIOLOGY

Outcomes: Upon completion of this unit the student will be able to describe cell structure and how the parts of the cell function to perform jobs for the organism and the structure and function of the Plasma Membrane.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Compare microtubules and microfilaments in structure and function, including cilia and flagella.
						List and describe the organelles and know both structure and function.
						List and describe the structures comprising the cellular architecture.
						Diagram a cell membrane, showing and describing the components. Include the fluid mosaic model.
						Discuss the functions of the plasma membrane.
						Compare the various mechanisms of cell membrane transport.
						Assess the cells surface molecules and their arrangement in regard to the biological functions of these molecules. Explain how they are involved in membrane reception and cell signaling.
						Outline the phases of the cell cycle and explain the activity occurring in each phase.
						Identify the mitotic phases & structures in both plant & animal cells.
						Summarize the factors that cause cells to undergo mitosis.

UNIT 2: THE NERVOUS SYSTEM

Outcomes: Upon completion of this unit the student will gain an understanding of the process of nervous system function and structure.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Classify the organs of the nervous system into central and peripheral divisions.
						Describe the functions of neuroglia.
						Describe the structure and functions of neurons.
						Compare the basic types of ion channels and explain how they relate to action potentials.
						Outline a flowchart showing the series of steps for the development and implementation of an action potential.
						Discuss brain wave patterns and the EEG
						Describe the protection, gross anatomical features and cross sectional structure of the spinal cord.
						Describe the functions of the principal sensory and motor tracts of the spinal cord.
						List and describe the spinal nerve structure and give the four plexuses and major nerve innervation of main body regions.
						Describe the composition and coverings of a spinal nerve.
						Describe the components of a reflex arc and its relationship to homeostasis.
						Identify the twelve pairs of cranial nerves by name, number, type, location (origin), and function.
						Give the course of cranial nerve pairs through the skull

UNIT 3: SPECIAL SENSES

Outcomes: Upon completion of this unit the student will gain an understanding of the special senses of the nervous system.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the function and pathway of taste (gustation), including structure of taste bud, physiology and nerve pathway.
						Describe the structure and physiology of smell (olfaction), including nerve pathway.
						Diagram the parts of the eye, including accessory structures, and the functions.
						Discuss the physiology of vision.
						Diagram and label the parts of the ear.
						Discuss the physiology of hearing, including nerve pathways.
						Discuss the physiology of balance and equilibrium.

UNIT 4: RENAL FUNCTION

Outcomes: Upon completion of this unit the student will gain an understanding of the structure and function of the excretory system.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						List all parts and regions of the kidneys gross anatomy, external and internal.
						List all microscopic components of kidney anatomy (nephron).
						Compare how glomerular filtration, tubular reabsorption, and tubular secretion each function to maintain water and electrolyte balance.
						Evaluate the effectiveness of urinalysis to detect abnormal chemical states of the body.
						Label sites in nephron anatomy for pH adjustment and explain the events.
						Compare the usual difference in pH for arterial and venous blood.

UNIT 5: THE REPRODUCTIVE SYSTEM

Outcomes: Upon completion of this unit the student will gain an understanding of the structure and function of the organs of reproduction.

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Distinguish between interstitial cells and seminiferous tubules of the testes.
						Discuss the male reproductive physiology, including the order of anatomical regions encountered by a sperm cell in the male reproductive tract and include composition of the seminal fluid.
						Construct a diagram to demonstrate hormonal integration of male reproductive physiology.
						List the male essential and accessory reproductive organs.
						List the female essential and accessory reproductive organs.
						List the events of the menstrual cycle and ovarian cycle.
						Discuss female reproductive physiology.
						Diagram and label the major stages in the formation of male and female gametes by meiosis (oogenesis and spermatogenesis).

Projects Required:

As assigned. A semester project may be required and will be explained by the instructor.

Text Book:

Contact Bookstore for current textbook.

Materials/Equipment Required:

None

Major Pieces of Equipment:

A computer with Microsoft Office 2003 and internet access.

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.