

COURSE PROCEDURE FOR**HUMAN ANATOMY AND PHYSIOLOGY II**

BIO4149 4 Credit Hours

Student Level:

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

Catalog Description: BIO 4149 - HUMAN ANATOMY AND PHYSIOLOGY II (N) (4 hrs)

This course represents the second of an eight (8) credit hour Anatomy and Physiology course and is designed to provide students with a thorough study of the anatomy and physiology of the human body. The student is expected to enroll in the first half of the course (BIO4148) during the same academic year, and both courses (BIO4148 and BIO4149) must be taken to be equivalent to BIO4150 Anatomy and Physiology. Lecture and lab studies will include: the cardiovascular system, lymphatic system, respiratory system, digestive system, metabolism, urinary system, electrolyte and acid-base balance and reproductive systems.

Prerequisite:

The student must successfully complete BIO4148, Human Anatomy and Physiology I.

Controlling Purpose:

This course represents the second of an eight (8) credit hour Anatomy and Physiology course and is designed to provide students with a thorough study of the anatomy and physiology of the human body. The student is expected to enroll in the first half of the course (BIO4148) during the same academic year, and both courses (BIO4148 and BIO4149) must be taken to be equivalent to BIO4150 Anatomy and Physiology. Lecture and lab studies will include: the cardiovascular system, lymphatic system, respiratory system, digestive system, metabolism, urinary system, electrolyte and acid-base balance and reproductive systems.

Learner Outcomes:

Upon completion of the course, students will have an understanding of the structural levels of body organization, of the gross and microscopic anatomy of the body systems, of the concept of homeostasis, and of the physiology of each body system. Those students entering professional training in the health sciences will be at a level of competency required in that training.

The learning outcomes and competencies detailed in this course meet, or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Project for this course, as sanctioned by the Kansas Board of Regents.

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: THE CARDIOVASCULAR SYSTEM						
Outcomes: Upon completion of this unit the student will gain an understanding of the structure and function of the heart, vessels and blood.						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the ABO and Rh of blood grouping.
						Differentiate between the five leukocyte types by three criteria.
						Outline the events in the blood clotting pathways leading to the formation of fibrin.
						Describe the heart's location, size, and position.
						Organize an outline of heart anatomy based on chambers, valves, and attached blood vessels.
						Label the segments of an unlabeled ECG and match each event to a cardiac cycle occurrence.
						Given any two of three variables (cardiac output, heart rate, and stroke volume), solve for the value of the third.
						Given a random list of cardiac cycle events, rank the list in their logical order of occurrence.
						Outline the pattern of blood circulation throughout the body, including systemic, pulmonary, coronary, hepatic portal, & fetal circulations
						Explain blood pressure & its functional interrelationships with cardiac output, peripheral resistance, & hemodynamics

UNIT 2: THE LYMPHATIC SYSTEM

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

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Explain the functions of the lymphatic system.
						Describe lymph formation and flow mechanisms.
						Distinguish between lymph and plasma.
						Define and describe non-specific resistance to disease & the inflammatory response.
						Explain antibody-mediated (humoral) immune response, cell-mediated immune response and the roles of B cells & T cells in immune response.

UNIT 3: THE RESPIRATORY SYSTEM

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

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Rank the respiratory compartments in the order exhaled air encounters them.
						Explain how Boyle's Law facilitates understanding of the inhalation - exhalation cycle.
						Explain how Dalton's Laws facilitate understanding of gas exchange.
						Explain factors that regulate the rate and depth of respiration.
						Given three of four air volumes (VC, TV, IRV, and ERV), calculate the fourth.
						Distinguish between external and internal respiration.
						Identify the gross & microscopic anatomy of the respiratory tract & related organs.
						Explain the mechanisms of gas exchange in the lungs and tissues.
						Explain the mechanism of gas transportation in the blood.

UNIT 4: THE DIGESTIVE SYSTEM

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

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Select twenty GI segments and subsegments and rank them in order a moving food mass encounters them.
						Construct a table depicting where the carbohydrates, lipids are progressively digested throughout the GI tract.
						Differentiate between mechanical and chemical digestion.
						Differentiate among the cephalic, gastric, and intestinal phases of gastric secretion.
						Outline how the hormones gastrin, secretin, and enterogastrone integrate to regulate GI activity on a meal high in proteins and lipids.
						Discuss the functions of the accessory organs of digestion, including the liver, gall bladder and pancreas.
						Describe the catabolism and anabolism of carbohydrates, lipids and proteins.
						Explain the hormonal and neural regulation of metabolism.
						Outline the major nutrients and their metabolic functions.

UNIT 5: THE EXCRETORY SYSTEM

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 kidney's gross anatomy, external and internal.
						List all microscopic components of kidney anatomy, including detailed histology of the nephron.
						Factors regulating & altering urine volume & composition, including the renin-angiotensin system and the roles of aldosterone & antidiuretic hormone. Predict the change in water balance of the body by ADH deficiency.
						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.
						Describe the functional processes of urine formation, including filtration, reabsorption, secretion, & excretion.

UNIT 5: THE EXCRETORY SYSTEM

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:
						Explain how body water is distributed into compartments.
						Discuss abnormal states causing edema.
						Label sites in nephron anatomy for pH adjustment and explain the events.
						Relate buffer pair action to respiratory and renal mechanisms as they comprehensively maintain ECF pH.
						Describe the major fluid compartments, including intracellular, extracellular, intravascular, & interstitial.

UNIT 6: THE REPRODUCTIVE SYSTEMS AND DEVELOPMENT

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.
						Plot the order of anatomical regions encountered by a sperm cell in the male reproductive tract and include 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.
						Rank the events of the menstrual cycle into ten distinct parts.
						Plot the menstrual cycle changes over 28 days; integrate the interactions of gonadotropins, estrogens, and progesterans.
						Describe the development of the embryo/fetus & the hormonal changes during pregnancy, parturition & labor.
						Outline the process of reproductive cell division (meiosis, gametogenesis and folliculogenesis).
						Explain sex determination and method of inheritance through human genetics.

Projects Required:

None

Textbook:

Contact Bookstore for current textbook.

Materials/Equip:

Compound microscopes.

Human skeletons - articulated and disarticulated of both human bone & plastic.

Prepared microscope slide of normal and pathological human tissues.

Miscellaneous preserved cadaver material and models.

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.