LOS MEDANOS COLLEGE

ARTICULATION AGREEMENT **DATE DRAFTED**: April 2024
VALID ACADEMIC YEAR(S): FA24-SP25

LMC COURSE: BIOSC-030 Introduction to Anatomy and Physiology
HIGH SCHOOL COURSE: Anatomy & Physiology
TEACHER: Cynthia Bruins
School: Freedom High School
Address: 1050 Neroly Rd., Oakley, CA 94561

A. **COLLEGE COURSE DESCRIPTION:** This course is designed to cover basic anatomy and physiology. Fundamentals of body structure and function and the elegant interrelationships between body organs and how they perform will be explored. All the systems of the body, including very basic microscopic anatomy and simple physiological chemistry will be covered in this one semester course.
B. **UNITS: 4**
C. **PRE-REQUISITES: NA**
D. **HIGH SCHOOL CLASS DESCRIPTION:** Anatomy & Physiology is a lab-based course dedicated to the study of human body systems. I am so excited to work with you as you prepare for college and a career in the medical field. In this class, there will be labs, activities, projects, and dissections. The dissections in this course are important to learning and understanding how the structures and functions of the human organ systems maintain homeostasis. You will gain the knowledge and skills necessary to further your knowledge in a college-level Anatomy and Physiology course. By nature of the content, this class will challenge your work ethic and perseverance all the while having fun exploring the wonders of the human body.

E. **REQUIRED CONTENT FOR ARTICULATION:**
1) **Introduction to Body Systems** – the student will:
   a) Identify important fields of study that comprise the biological sciences.
   b) Know the nine body systems and understand their major functions and the complexity of their organization.
   c) Identify and use the prefixes, suffixes, and roots in science terminology.
   d) Understand the basic concepts of homeostasis and feedback loops.
2) **Principles of Chemistry** – the student will:
   a) List the levels of organization and characteristics of each.
   b) Understand what an organic and inorganic compound is and how the human body uses it
   c) Explain principle chemical reactions of the body to include metabolic reactions
   d) Explain what metabolism is and how it relates to homeostasis.
   e) Explain the difference between a calorie and Calorie
   f) Understand acids and bases and how they apply to the human body.
   g) Understand how enzymes function in different types of chemical reactions in the body
3) **Cellular and Intercellular Organization** – the student will:
   a) Understand the structure and function of the microscope.
   b) Describe typical cellular membrane and explain each type of cell transport and the substances that are moving
   c) Explain the function of each type of organelle
   d) Describe variability between cells
   e) Describe the cell cycle.

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f) Identify key features within each of the stages of Mitosis
g) Differentiate between the four major tissue types of the body
h) Lab Practical: Identify the different major tissue types by name and location

4) **Integumentary**- the student will:
   a) Describe the function of the integument and the functions of each type of body membrane
   b) List and describe the structures associated with the skin
   c) Describe the factors that determine skin pigmentation
   d) Explain how the skin is involved in thermoregulation
   e) Project: research and present a skin disorder/disease to include cultural and ethnic differences
5) **Skeleton** – the student will:
   a) Describe the microscopic and macroscopic structures between the main kinds of bones.
   b) Contrast the skull of a newborn infant (or fetus) with that of an adult.
   c) Discuss the importance of the intervertebral discs and spinal curvatures (lordosis and kyphosis) and the impact of abnormal spinal curvatures (scoliosis, hyperlordosis, and hyperkyphotic).
   d) Differentiate between a male and a female pelvis.
   e) Name, describe and explain the movement for each joint categories
   f) Differentiate between the bone formation in the fetus and growth during childhood
   g) Understand the role the skeletal system has in calcium homeostasis.
   h) Explain the impact on bone during bone remodeling, exercise, and disease.
   i) Explain how fractures occur in a bone and differentiate between the various types of fractures
   j) Identify the bones, specific landmarks and foramen of the body.
   k) Lab Practical: Identify names & locations of bone between the major divisions of the skeleton.
6) **Muscles** – the student will:
   a) Describe the microscopic and macroscopic structures of the skeletal muscle.
   b) Describe the importance and identify the parts of the sarcomere as the functional unit.
   c) Describe the neuromuscular junction.
   d) Outline the steps of muscle contraction.
   e) Explain the three types of muscle contraction based on movements
   f) Distinguish between fast-twitch and slow-twitch muscle fibers as it relates to movements.
   g) Explain the concept of fatigue and how muscles adapt to fatigue based on use/disuse
   h) Understand how homeostasis is maintained during exercise.
   i) Define and give an example of: origin, insertion, antagonist, synergist, and prime mover.
   j) Identify and give the actions of the major muscles of the body
   k) Lab Practical: Identify the name, location & action of major muscles of the body.
7) **Nervous System and Sense Organs** – the student will:
   a) Describe the general structure and classification of neuron types.
   b) Name and describe the three physiological properties of nerve tissue.
   c) Describe the process in how neurons function.
   d) Name and describe the two major divisions of the nervous system.
   e) Describe the somatic senses explaining receptors associated with the sense of touch, pressure, temperature, and pain.
   f) Explain the relationship between the sense of smell and taste.
   g) Name the parts of the ear and explain the function of each.
   h) Lab Practical: Identify and name the different parts of the brain.

8) **Endocrine System and Hormone Functions** – the student will:
   a) Compare and contrast the ways in which the nervous and endocrine systems regulate body functions
   b) Compare the structure and function of the exocrine, endocrine, and heterocrine glands.
   c) Identify the primary functions of major endocrine glands and describe the physiological effects of hormones on target cells.

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d) Describe the sequence of events in feedback control of hormone production by using real world examples.
e) Explain the terms hyperfunction and hypofunction and deduce related diseases.

9) **Circulatory & Respiratory System** – the student will:
   a) Correctly identify structures, tissues and organs involved with the cardiorespiratory systems and the general function of each
   b) Identify and state the function of erythrocytes, leukocytes, platelets, and list components of blood plasma.
   c) Describe the blood-clotting process and factors that impact the clotting process
   d) Distinguish between blood types and explain the importance of knowing a persons blood type.
   e) Describe the pathway of the blood naming chambers, valves, and connecting vessels including the heart.
   f) Understand the cardiac conduction cycle by explaining what an EKG represents.
   g) Relate the effects of various chemicals and physical factors to the rate of the heartbeat.
   h) Describe how the body maintains normal blood pressure.
   i) Explain the process of gas exchange in the lungs and tissues and how blood is transported through the body
   j) Explain how respiration is regulated within the body, including the physiological factors that influence respiratory rate and the importance of carbon dioxide on ventilation
   k) Lab Practical: Identify and name the different parts of the heart and blood flow.
10) **Digestive Systems and Nutrition** – the student will:
   a) Trace the events of digestion from the mouth to the stomach and through the intestines, including the study of enzymes and other components that aid digestion.
   b) Differentiate between mechanical and chemical digestion
   c) Explain how villi aid digestive processes in the small intestine
   d) Lab Practical: Identity, name and give function to the digestive system including accessory organs.
11) **Lymph & Immune System** – the student will:
   a) Describe the principle functions of the lymphatic organs and the entire lymph system.
   b) Distinguish between lymph and plasma fluid.
   c) Compare active immunity to passive immunity and state an example of each.
   d) Explain how two major types of lymphocytes are formed and how they function in immune mechanisms.
   e) List the five antibody classes and describe their specific roles in immunity
   f) Explain how allergies, asthma, clotting and swelling are all immune responses.
12) **Excretory System** – the student will:
   a) Identify the anatomy and explain the function of the organs involved in the excretory system
   b) Explain the process of urine formation in the process of excreting metabolic wastes and maintaining normal water balance (identifying the areas of the nephron that are responsible for filtration, reabsorption, and secretion).
   c) Explain the role of antidiuretic hormone (ADH) and aldosterone in the regulation of water and electrolyte balance by the kidney.
   d) Describe where metabolic acids originate and explain the role of buffers
13) **Reproduction and Development** – the student will:
   a) Describe the structure and function of both male/female reproductive systems and their organs.
   b) Order the physiological events of the male/female reproductive systems.
   c) Differentiate between the effects of FSH and LH on functions in the ovary and testicle.
   d) Sequence events that occur in fetal development.
   e) Compare the sequence of events between spermatogenesis and oogenesis.
14) **Study Skills** – the student will:
   a) Express ideas in note-taking form.

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b) Analyze graphs, charts, and maps.
c) Use SQ3R method of reading and remembering.
d) Organize information by outlining or mapping.
e) Use the library including the Internet for research.
f) Use survey of books, assignment schedules, and working assignment sheets to manage time.

15) **Disease and Health Careers** – the student will:
a) Explore at each system, related health careers and requirements involved in preparing for those careers.
b) Investigate different diseases and medical conditions relating to the systems of the human body.

F. REQUIRED COMPETENCIES (PERFORMANCE OBJECTIVES) FOR ARTICULATION

LMC Learning Objectives:

It is the expectation that all students successfully completing the course will be able to…

1) Use appropriate terminology to effectively communicate aspects of human anatomy and physiology with various audiences.

2) Identify various anatomical structures (e.g., cells, tissues, organs) and describe the interrelationships between the structure and its function.

3) Explain the various mechanisms used for regulating homeostasis and describe how body systems are integrated to maintain homeostasis.

4) Propose evidence-based hypotheses to explain how the human body functions in a real-world scenario or provide a conclusion to the functions of various structures or the physiological regulations of the human body tested in laboratory settings.

Additionally, students are expected to develop and work on refining the following cognitive skill development goals:

1. Work with others in small groups toward a common goal(s) and discuss topics related to this course in an intellectual manner.

2. Critically think for yourself and show an ability to approach issues of anatomy and physiology from an evidence-based perspective

3. Recognize that individual differences (ethnicity, gender, culture, etc.) shape our understanding of anatomy and physiology

G. METHODS FOR END OF COURSE ASSESSMENT:

Grading: Standards and Benchmarks:

Tests, Quizzes, and Lab Practical's	45%
Labs, Projects & Collaboration	45%
Homework	10%

Grading Percentage Distribution

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A+ 97% – 100%	C+ 77% - 79%	F Below 60%
A 96%-- 94%	C 76% - 74%	
A – 93%- 90%	C – 73%- 70%	
B+ 87% – 89%	D+ 67% - 69%	
B 86%-- 84%	D 66% - 64%	
B – 83%- 80%	D- 63% - 60%	

H. TEXTBOOKS OR OTHER SUPPORTING MATERIALS

- **Human Anatomy & Physiology, 11th Edition**
  Elaine N. Marieb, Holyoke Community College
  Katja Hoehn, Mount Royal University

I. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:
(all of the following must be met)

1. Students **must apply** to Los Medanos College and register in **CATEMA** in order to receive credit recommendations by their high school teacher.
2. Students **must be recommended** for credit by their high/adult ed. school teacher in **CATEMA.** *Teachers recommend credit at their discretion.*
3. Students **must complete** the **Freedom High School Anatomy & Physiology class** with an overall grade of "B" or better.
   High school/Adult Ed. teachers will enter this grade in CATEMA.
4. Students **must earn** a "B" or better on the agreed upon college/high school final exam procedure.
   High school/Adult Ed. teachers will enter this exam grade in CATEMA.
5. Articulated college credit may only be recommended by the high school teacher and received by the student **within the academic year** in which it was earned.
6. Upon completion of the above, the student will receive on his/her LMC and CCCCD (California Community College District) transcript the units of credit for LMC's **BIOSC-030 "Introduction to Anatomy & Physiology** course.
7. College transcripts will reflect the **FINAL EXAM GRADE** earned and will be notated as *Credit by Exam.

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Address: 1050 Neroly Rd., Oakley, CA 94561

COLLEGE SIGNATURES

A'kilah Smith (Aug 8, 2024 07:15 PDT)

A'kilah Moore Ed. D. Date
LMC Vice President of Instruction

Nicole Trager (Aug 7, 2024 21:09 PDT)

Nicole Trager Date
Dean of Instruction Math & Physical Sciences, Interim

Melissa Wheeler
Melissa Wheeler (Apr 26, 2024 18:10 PDT)

Dr. Melissa Wheeler Date
LMC Biology Department Faculty

HIGH SCHOOL/ROP/DISTRICT SIGNATURES

Steve Amaro (Aug 8, 2024 07:20 PDT)

Steve Amaro Date
FHS Principal

Erik Faulkner
Erik Faulkner (Aug 8, 2024 08:28 PDT)

Erik Faulkner Date
LUHSD Asst. Superintendent, Educational Services

Cynthia Bruins (Aug 8, 2024 07:27 PDT)

Cynthia Bruins Date
FHS Faculty

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BIOSC-030_FHS_ARTIC_Renewal_FA24-SP26

Final Audit Report 2024-08-08

Created:	2024-04-09
By:	Colleen Grim (cgrim490@email.4cd.edu)
Status:	Signed
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