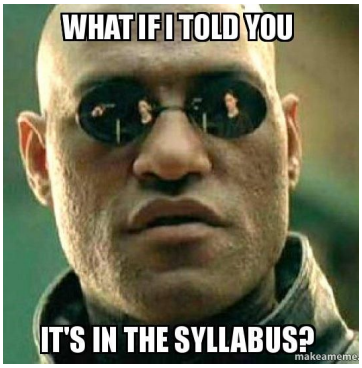
ANATOMY AND PHYSIOLOGY I SYLLABUS



CONTACT INFORMATION:
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REQUIRED TEXTBOOKS AND MATERIALS:
Essentials of Anatomy and Physiology (9th Edition) (11th Edition online) by Elaine Marieb
Pearson Mastering A and P (online access)
Organized notebook (3-ring binder suggested), paper, and writing materials.

OPTIONAL TEXTBOOKS AND MATERIALS: (may be purchased at www.myPearsonStore.com)
Essentials of Anatomy and Physiology Lab Manual (6th Edition) by Elaine Marieb (optional)
The Anatomy and Physiology Coloring Workbook: A Complete Study Guide (11th Edition) by Elaine Marieb (optional)
The Unity of Form and Function (7th Edition) by Kenneth Saladin, and other materials to be selected by instructor (provided).
Personal dissecting kits, colored pencils, or markers (optional)

PREREQUISITES:
Prerequisites: Biology I (Grade of C or better) and Chemistry (Grade of C or better)

COURSE DESCRIPTION:
Welcome to the wonderful world of anatomy and physiology! A class designed to explore one of the most amazing machines ever assembled, of course, we are talking about the human body! We won't be using cadavers, but we do have an abundance of support, learning tools, and technology at our disposal. During the course of study, we will investigate the following topics and systems: Orientation of the Body, Chemistry of Life, Cellular Structure and Function, Histology, Integumentary, Skeletal, Muscular, Nervous, Special Senses, Endocrine, Blood, Cardiovascular, Lymphatic, Respiratory, Digestive, Urinary, and Reproductive systems. We are going to approach this class from an introductory perspective. Anatomy and physiology can be quite a challenging discipline on many levels. I like to take a deeper rather than wider perspective. The intention of this course is to cover the essential information of each unit. Students will have the opportunity to learn thousands of new terms and concepts and the course may even be considered as learning a whole new language. The challenges will be great, but the rewards will be worth the effort!

Upon completion, students should be able to demonstrate an in- depth understanding of principles of anatomy and physiology and their interrelationships. Laboratory work includes dissection of preserved specimens, microscopic study, physiologic experiments, computer simulations, peer teaching and curriculum development, and multimedia presentations. **There will be SEVERAL DISSECTIONS!** Comparative anatomy is an essential tool to learn about the human body. Dissections will include, but are not limited to frogs, rats, fetal pigs, cats, and various sheep or cow organs. Participation in these activities is required and is critical to success in the course. Completion of this course will provide students with equivalent knowledge and skills of pre-major and/or elective college course requirements.

Course Hours Per Week: M - F; 55 minutes;
Combination of class work and labs to be worth 1 high school lab science or elective credit.

LEARNING OUTCOMES:
Upon completion of this course, the student will demonstrate basic knowledge in the following:

1. Describe the major anatomical components of each human body system studied, describe briefly their anatomical locations and general structures, and explain their physiological functions at all levels from molecular components to cells, tissues, organs, organ systems and complete multicellular organisms.
2. Describe the regulation of the human body and explain how body systems studied are integrated.
3. Apply the concepts learned in the lecture to understand and analyze laboratory activities and observations.
4. Create valuable labs, activities and assessments for peers in the discipline of anatomy and physiology.
5. Construct a comprehensive Cat Dissection Portfolio Capstone Project that integrates the application of all knowledge and skills acquired throughout the course.

OUTLINE OF INSTRUCTION:

I. Orientation of the Body
- A. Anatomical terminology
- B. Directional terminology
- C. Planes and regions of the body
- D. Overview of body systems, rat practical exam

II. Chemistry of Life
- A. Basic inorganic chemistry review
  - a. atoms, molecules, compounds, bonding
  - b. pH, acids, bases, salts
- B. Basic organic chemistry review
  - a. Macromolecules, proteins, enzymes, DNA, RNA, lipids, carbohydrates

III. Cellular Structure and Function
- A. Cell types, organelles, structure and function
- B. Cellular transport, communication, reproduction
- C. Cell differentiation, cell cycle regulation, stem cells, cancer

IV. Histology
- A. Tissue types and functions, characteristics, practical exam
- B. Microscopy

V. Integumentary
- A. Receptors: touch, pressure, nociceptors, chemoreceptors, mechanoreceptors,
- B. Structure, functions, accessory organs (hair, nails, glands)
- C. Burns, wound healing, skin cancer

VI. Skeletal
- A. Types of bone
- B. Bones and bone markings, practical exam
- C. Osteogenesis, bone growth and remodeling
- D. Fractures, healing, pathology
- E. Articulations

VII. Muscular
- A. Types and names of muscles, shapes, structure and function
- B. The sarcomere, excitation-contraction-coupling-relaxation
- C. Epimysium, perimysium, endomysium
- D. Graphical analysis of muscle contraction (smooth, cardiac, skeletal)
- E. Length-tension relationship, twitch, wave summation, tetanus
- F. Energy use in the muscle, short-term, intermediate, and long-term energy supply and demand
- G. Types of contractions, concentric, eccentric, isotonic, isometric
- H. Pathology

VIII. Nervous
- A. Types of neurons and support cells
- B. Neuron action potentials
- C. Epineurium, perineurium, endoneurium (fiber size)
- D. Recruitment, nerve impulse velocity (myelinated vs unmyelinated)
- E. Brain structure and function, sheep brain practical exam
- F. Memory, emotion, and learning
- G. Cranial and spinal nerves
- H. Somatic and autonomic divisions of the nervous system
- I. Sympathetic and parasympathetic control
- J. Spinal cord, nerves, reflexes
- K. Pathology

IX. Endocrine system (flipped classroom week)
- A. Hypothalamic, anterior pituitary, posterior pituitary hormones
- B. Endocrine glands through cat dissection
- C. Feedback mechanisms
- D. Pathology

X. Blood
- A. Basic hematology - plasma and cellular components
- B. Hemostasis, Hematopoiesis,
- C. Hemoglobin production, iron cycle, oxygen transport
- D. Microscopy, blood cell identification
- E. Blood groupings

XI. Cardiovascular system
- A. The heart, structure, function, sheep heart practical exam
- B. Regulation of cardiovascular system, cardiac conduction system
- C. EKG, normal vs abnormal rhythms
- D. Blood Pressure Determinations,
- E. Peripheral circulation, blood vessel names and identification, through cat dissection
- F. Special circulations, hepatic portal, fetal, and Circle of Willis through cat dissection

XII. Lymphatic system
- A. Lymphatic organs structure and function through cat dissection
- B. Nonspecific and specific defense mechanisms through cat dissection
- C. Hypersensitivity and tissue rejection through cat dissection
- D. HIV and AIDS

XIII. Digestive system through the cat dissection
- A. General plan of the alimentary canal
- B. Organs of digestion
- C. Application of macromolecule breakdown, absorption, and biosynthesis
- D. Metabolism and nutrition

XIV. Respiratory system through cat dissection
- A. Pulmonary anatomy
- B. Mechanics of breathing
- C. Measurement of pulmonary function
- D. Control of breathing
- E. Gas laws and gas exchange
- F. Gas transport mechanisms

XV. Urinary system through cat dissection
- A. Anatomy of urinary system structure and function
- B. The nephron
- C. Urine formation and control
- D. Composition of urine
- E. Pathology
- F. Micturition

XVI. Reproduction through the cat dissection
- A. General terminology
- B. Hormonal control of male and female reproductive systems continued from the Endocrine system
- C. Male reproductive system
- D. Female reproductive system
- E. Fetal Development

XVII. Capstone Project: Cat Dissection Portfolio Project
- A. Comprehensive structure and function of all body systems and their interactions
- B. Creation of a photographic portfolio of all required criteria with structures, functions, and descriptions
- C. Comprehensive research and completion of narrative responses to questions concerning *Felis catus silvestris*
- D. Successful completion and mastery of group collaboration and individual portions of the overall project

GOALS:

In addition to course content, students will learn to -

- Think critically, logically, and realistically
- Develop hypotheses and design and conduct scientific experiments
- Write high quality scientific essays citing evidence to support explanations
- Conceptualize, apply, and evaluate information, rather than memorize random facts
- Collect, organize, interpret and analyze scientific data
- Solve problems by using sound scientific methodology and thinking processes
- Learn to critically read, annotate, and summarize challenging informational and technical texts for understanding
- Develop effective communication skills using all four modalities of language
- Master the ability to effectively express ideas in discussion and engage in established classroom discourse
- Develop productive note-taking skills

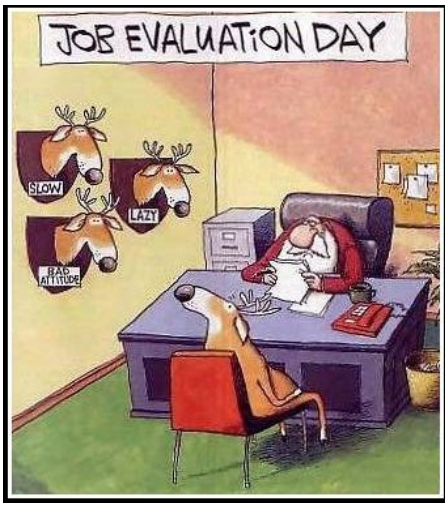
SAFETY CONSIDERATIONS:

I like to think that the Anatomy and Physiology experience is supposed to be fun and humor is an essential part of the classroom environment. However, there is a certain element of **potential danger** with **chemicals and sharp instruments** used in the lab (please see **Lab Safety Contract**). Therefore, a **NO TOLERANCE** policy will be observed for behavior problems or safety issues. Behavior problems will first be discussed individually with each student. Students will be treated respectfully as young adults. First-time offenders may be put on lab clean-up duty at lunch or before or after school. Continued problems would involve conferences with parents, the student, and administrators, and **possible removal from the class.** A safe learning environment will be preserved for all students at all times. Safety contracts will be collected and kept on file before students may conduct labs.

EVALUATION:

The mandatory FUSD grading system is explained below:

- **85% Broken down as follows: (**equivalent to 100% of all grades before the final**)**
  - **Practice – Formative Assessments** (Homework, papers & assignments). (Some labs, activities, and in-class-projects may be included).
  - **Measurement – Summative Assessments - (**Exams, quizzes, & lab practicals). (Some larger labs, in-class activities, and large projects).
- **15% Final Exam**



GRADING SCALE:

89.5 -100	**A**
89.4 -79.5	**B**
79.4 - 69.5	**C**
69.4 - 59.5	**D**
Below 59.4	**F**

ADVICE AND TIPS For SUCCESS:

The goals from my side of the desk are likely the same as yours when it comes to being a successful Anatomy and Physiology student. I would like to see every student in the class attain a grade of **C or better**. It is really quite simple if you follow **THIS ADVICE:**

- **Show up on time to class EVERYDAY.** Tardies & absences contribute to lost learning experiences that cannot be recovered just by making up assignments.
- **Bring all necessary materials to class EVERYDAY.** Be **prepared** to take an active part in teaching and learning.
- **Complete & turn in assignments regularly and on time on given due dates.**

  LATE Work IS NOT ACCEPTED.
- **Daily work, labs, and projects are not accepted late under any circumstances except in case of excused absence or teacher-approved emergency.**
- **Study hard and work well with others.** Expect to read a minimum of 45 minutes per night. **See HW Rubric!**
- **Keep up from the get-go; it is nearly impossible to get out of a hole later on.**
- **Missed work or assessments due to absence are the responsibility of the STUDENT!** Make up times can be arranged at lunch or before or after school.
- Learning can be fun, but nothing worthwhile comes easy.

STUDY TECHNIQUES:

The most common problem students have is that their study skills are not adequate for high school level classes. Studying for classes involves more than just "cramming the night before a test." Chapter Reviews are provided at the end of each chapter and study resources are posted on Google Classroom for each section studied. The following are suggestions are listed to help improve your grade in Anatomy and Physiology and other high school or college courses.

1. Prepare to participate in class before class begins by reading over your notes you have previously written and also read over the sections of your text that will be covered prior that day's scheduled lecture/activity.
2. Create and use a vocabulary list consistently as you work through each section.
3. Complete all worksheets, study questions, labs, reading assignments, and activities, etc.
4. Keep your handouts, lecture notes, and study questions organized in a notebook.
5. Always read assigned material and outline all the main ideas for each section.
6. Pay attention and actively participate in class.
7. Study frequently and consistently in small doses. ***Cramming does not foster long-term understanding that will stick with you!***
8. Set up a study group and study with friends.
9. Closely study figures, sidebars, and diagrams from lecture and from your text.
10. **If you are having trouble with the material, get help early. Do not wait until TEST DAY!!!**

I am looking forward to an exciting year! Best of Luck and may we learn a lot from each other.

Sincerely, Mr. Smith