

**Introduction:**

Anatomy and Physiology 12 is an extremely content heavy, fast paced course. We will be covering a wide variety of topics related to cell and human biology which will include a significant amount of terminology to know and complex processes to understand. It will be critical to your success in this course that you attend classes, regularly review your notes, complete all homework and assignments, and ask questions when you are unsure.

Course Content**Big Ideas****Key Topics**

<u>Homeostasis is maintained through physiological processes.</u>	Cellular Compounds & Biological Molecules, Dehydration & Synthesis Reactions, Enzymes & Metabolic Pathways, Feedback Loops
<u>Gene expression, through protein synthesis, is an interaction between genes and the environment.</u>	Cell Structure, DNA Replication, Protein Synthesis, Genetic Mutations & Technologies, Transport Across the Cell Membrane, Surface Area to Volume Ratio,
<u>Organ systems have complex interrelationships to maintain homeostasis.</u>	Tissue types, Digestive, Cardiovascular, Lymphatic, Respiratory, Nervous, Endocrine, Urinary, and Reproductive Systems

Curricular Competencies

Curricular Competencies (questioning/predicting, planning/conducting, processing/analyzing, evaluating, applying/innovating, and communicating) are integrated throughout Anatomy & Physiology 12. Students build competency through activities and assignments such as lab exercises, student-designed labs, dissections, research-based presentations, and independent/group projects.

Materials

- 3 ring binder with plenty of paper
- Agenda book/Organization app on a device
- Several colours of pens (a 4 colour pen is a great thing to have for any biology course)
- Ruler
- Optional eye protection (Eye protection will be provided to you but some students find the inevitable finger prints distracting and choose to bring their own since you will need them for every science lab)

Assessment

Assessment for this course will be based on a combination of in class lab assignments, homework questions, group and individual projects, chapter quizzes, and unit tests. This course is split into 2 distinct sections with one focused on cell biology and physiology and the other focused on human anatomy each with a final test.

A note on cheating and plagiarism: You may not use answers directly from google on tests or assignments. If you use google to study for exams be sure that you are able to answer questions in your own words without using direct quotes from internet searches.

It is very easy to tell when someone is giving an answer that is not their own and it leaves me with no choice but to give you a mark of "0" on the test or assignment.

Marks

Final marks will be determined as follows:

Labs and Assignments

Quizzes and tests

Homework questions

This year in biology you will encounter several new concepts and will need to remember many new terms and processes that may not be intuitive to you. Regular attendance, clear and efficient note taking, and active participation are critical to success. If you find yourself feeling confused or falling behind **Please ask for help!

Unit Breakdown

Unit 1- Cell Biology

Ch. 1/2 – Molecules of the cell

- Characteristics of life
- Process of science
- Basic chem (Atoms, periodic table, Molecules and compounds)
- Chemistry of water
- Organic molecules
- Carbohydrates, lipids, proteins, and nucleic acids

Ch.3 – Cell structure and function

- Levels of organization
- Eukaryotic cells vs prokaryotic
- Cytoskeleton

- Plasma membrane structure and function
- Permeability

Ch. 4 – DNA Structure and gene expression

- DNA Structure
- DNA Replication
- Gene Expression
- Gene mutations and cancer
- DNA Cloning
- Biotechnology and gene therapy
- Genomics, Proteomics, Bioinformatics

Ch. 5 – Metabolism: Energy and Enzymes

- Energy transformation and Metabolism
- Enzymes and metabolic pathways
- Metabolic rate and the thyroid and parathyroid glands

Ch. 6 – Cellular respiration

- Overview of cellular respiration
- Glycolysis (Outside of the mitochondria)
- Fermentation (Outside of the mitochondria)
- Inside the mitochondria

Unit 2 Human Anatomy and Physiology

Ch. 8- Human organization

- Types of tissues
- Organ systems
- Homeostasis
- Overview of the Endocrine System

Ch. 9 – Digestive system

- Digestive tract
- Accessory organs in digestion
- Digestive enzymes
- Disorders of the digestive system

Ch. 10- Circulatory and Lymphatic systems

- The blood vessels
- Blood
- The human heart
- The vascular pathways
- Fetal circulation
- The lymphatic system
- Innate and adaptive immunity
- Circulatory system disorders

Ch. 11- Respiratory System

- The respiratory system
- Mechanism of breathing
- Gas exchange in the body
- Disorders of the respiratory system

Ch. 12 – Nervous System

- Nervous tissues
- Transmission of nerve impulses
- The central nervous system
- The peripheral nervous system
- Disorders of the nervous system

Ch. 13 – Urinary System

- The urinary system
- Anatomy of the kidney and excretion
- Regulatory functions of the kidney
- Disorders of the urinary system

Ch. 14 – Reproductive system

- Male reproductive system
- Female reproductive system
- Ovarian and Uterine Cycles
- Disorders of the reproductive system