

HEALTH SCIENCE 1, SEMESTER B

Credits: 0.5

COURSE OVERVIEW AND GOALS

[Getting Started/Best Practices Template](#)

This one-semester course is intended as a practical, hands-on guide to help you understand the skills required to achieve success in modern-day careers. This course has 12 lessons organized into three units, plus three Unit Activities. Each lesson contains one or more Lesson Activities.

This course will cover various topics in health science, such as biomolecules, biological and chemical processes, and various diseases.

You will submit the Unit Activities to your teacher, and you will grade your work in the Lesson Activities by comparing them with given sample responses. The Unit Activities (submitted to the teacher) and the Lesson Activities (self-checked) are the major components of this course. There are other assessment components, namely the mastery test questions that feature along with the lesson; the pre- and post-test questions that come at the beginning and end of the unit, respectively; and an end-of-semester test. All of these tests are a combination of simple multiple choice questions and technology enhanced (TE) questions.

Prerequisite courses: Health Science 1, Semester A

Foundational skills: general literacy and communication skills needed for all high school online courses

By the end of this course, you will be able to do the following:

- ❖ Examine the structure, chemistry, and functions of organic compounds, including proteins, carbohydrates, lipids, nucleic acids, vitamins, enzymes, and antioxidants, and their roles in human health and disease.
- ❖ Apply knowledge of biochemistry and nutrition to construct meal plans and evaluate dietary choices, including the roles of carbohydrates, fats, proteins, vitamins, and minerals.
- ❖ Evaluate the principles of heredity, including the roles of DNA and RNA, dominant and recessive alleles, inherited diseases, and the sickle-cell trait.
- ❖ Evaluate the metabolic pathways, chemical reactions, and regulatory mechanisms that sustain life, including enzyme function, metabolism, and the effects of deficiencies and disorders.

- ❖ Examine the biological changes across the lifespan, including growth stages, environmental effects on sensory function, nutrition, and sexually-transmitted diseases.
- ❖ Analyze the mechanisms of homeostasis, disease transmission, and immune response, including primary and secondary defenses, autoimmune conditions, and common fatal diseases.
- ❖ Examine the structure and function of human tissues and the effects of tissue-level diseases on the body.
- ❖ Compare cloning methods, stem cell research and therapies, and the ethical and scientific implications of each.

COURSE COMPONENTS AND GRADING RUBRIC

The table gives a breakdown of the weight for each component in the course. Weight represents the percentage of the total score coming from each activity.

Course Components	Count	Weight *
Pretest. <i>A pretest is an optional assessment, typically designed for credit recovery. If a student shows mastery of a lesson objective, the student may be automatically exempted from the upcoming activities associated with the mastered objective. Pretests are not included as a component of the student's final grade.</i>	3	0%
Module. <i>Each module in this course contains an interactive tutorial or study and an associated mastery test. Tutorials and studies combine instruction and practice to prepare students for the mastery test, which is a computer-scored lesson-level summative assessment. The module score comes from a student's score on the mastery test.</i>	12	30%
Discussion. <i>A discussion activity is an opportunity for students to collaborate with their peers. An online threaded discussion mirrors the educational experience of a classroom discussion initiated when a teacher asks a complex, open-ended question. Students can engage in the discussion by responding both to the question and to the thoughts of others allowing for higher-order thinking about terminal objectives.</i>	3	10%

Course Components	Count	Weight*
Unit Activity. <i>A Unit Activity is at the end of a unit and constitutes one or more small tasks. Its purpose is to deepen understanding of key unit concepts and tie them together. Each Unit Activity includes a simple rubric. The teacher versions include both a rubric and modeled sample answers. Unit Activities are teacher graded.</i>	3	20%
Posttest. <i>A posttest appears at the end of each unit.</i>	3	20%
End-of-Semester Test. <i>An end-of-semester test (EOS) appears at the end of each course.</i>	1	20%
Total	25	100%

Weight* Teachers may manually adjust these weights if desired, per district grading requirements.

SCOPE AND SEQUENCE

UNIT 1: BIOMOLECULES

In this unit, you will learn about the structure and functions of amino acids and how they form proteins. You'll also discuss simple and complex carbohydrates, lipids, and lipoproteins. Additionally, in this unit, you will familiarize yourself with the chemistry and structure of DNA and RNA.

Activity	Activity Objective
Syllabus	Review the Course Syllabus at the beginning of the course.
Amino Acids and Proteins	- Identify amino acids and proteins and their functions. - Summarize the Human Proteome Project. - Examine diseases caused by protein misfolding, including symptoms, risks, and treatments.

Activity	Activity Objective
Simple and Complex Carbohydrates	- Identify the chemistry of simple and complex carbohydrates and the role of each in a healthy diet. - Examine various disorders related to carbohydrates, including causes and treatments. - Apply knowledge about carbohydrates to create a meal plan.
Lipids and Membranes	- Identify the properties and functions of lipids and biological membranes. - List amounts of fat found in common foods. - Examine the Fluid Mosaic Model of the cell membrane.
DNA and RNA	- Identify the structure, chemistry, functions, and evolution of DNA and RNA. - Examine the characteristics of inherited diseases.
Unit Activity: Biomolecules	Compare the structures, basic characteristics, and importance of various organic compounds in the body.

UNIT 2: BIOLOGICAL AND CHEMICAL PROCESSES

In this unit, you will learn about vitamins and cofactors. You'll differentiate between coenzymes and cofactors. You'll learn about carbohydrate, protein, and lipid metabolism. You'll also learn about anabolic and catabolic pathways and the relationship between the digestive process and metabolic pathways. Additionally, you'll learn about the biological and chemical processes of the human body.

Activity	Activity Objective
Vitamins and Cofactors	Identify usage, benefits, and risks of various vitamins and cofactors.

Activity	Activity Objective
Enzymes	- Recognize how enzymes control biochemical processes. - Examine how enzyme supplements might affect diseases. - Identify the characteristics of diseases caused by enzyme deficiencies.
Metabolism	- Identify the metabolic pathways and the processes involved in metabolism. - Examine diseases related to metabolic disorders, including symptoms and causes.
Biological Processes	- Recognize growth changes that correspond with the stages of life. - Identify the negative effects of some environmental conditions on the sensory functions. - Examine the pros and cons of sports drinks. - Summarize the causes, symptoms, and cures of a sexually-transmitted disease.
Chemical Reactions	- Identify the various chemical reactions that take place in the human body. - Examine the benefits of antioxidants and certain metals in the human diet.
Unit Activity: Biological and Chemical Processes	Identify the components of milk and the metabolic processes involved in breaking these components down into nutrients your body can use.

UNIT 3: DISEASE

In this unit, you will learn about homeostasis. You'll identify various diseases that affect different body systems. You'll learn how the immune system functions. You'll also learn about the four types

of tissue and their structure and functions. In addition, you will familiarize yourself with gene mapping and genetic diseases.

Activity	Activity Objective
Disease and Immunity	• Identify the steps in homeostasis. • Examine the characteristics of the most common fatal diseases in the United States. • Recognize the chain of disease transmission and how to break it. • Identify the first and second lines of defense the body has against disease. • Compare a primary and a secondary immune deficiency.
Human Tissues	• Identify types and functions of human tissues. • Examine the characteristic of human tissue diseases.
Genetic Research and Diseases	• Examine the roles of dominant and recessive alleles in heredity. • Compare different types of cloning. • Summarize characteristics of stem cell research and stem cell related therapies.
Unit Activity: Disease	• Examine the advantages and disadvantages of the sickle-cell trait.

COURSE MAP

You will achieve course level objectives by completing each lesson's instruction, assignments, and assessments. For a detailed look at how the materials meet these objectives, review the [course map](#).