

Texas Biology, Semester A

Course Overview

Texas Biology, Semester A, is a single-semester course designed to develop and enrich your knowledge in several core areas of biology. You will study cells, organs and organ systems, and heredity. This course consists of three units. In the first unit, you'll broaden your understanding of the nature of science and examine cell theory and cellular processes. In the next unit, you'll explore how human body systems function and interact. In the final unit of this course, you'll study the role of cell division in an organism's growth and development and learn more about heredity and genetics, including genetic mutations and inheritance patterns.

Course Goals

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

- Use the scientific method to investigate a biology question.
- Understand how to safely use laboratory tools for scientific investigations.
- Explain how different proteins produced by a cell carry out critical life functions through systems of specialized cells.
- Explain the working of different body systems using models.
- Conduct experiments to study the effect of exercise on muscles and heart rate and the effectiveness of enzymes under different conditions.
- Use a model to illustrate the role of mitosis and meiosis in producing and maintaining complex organisms.
- Make and defend a claim based on evidence that inheritable genetic variations may result from genetic mutations.
- Develop genetic models to calculate the probability of expressed traits in a population over several generations.
- Use statistics and probability to calculate variation and distribution of expressed traits in a population.

General Skills

To participate in this course, you should be able to do the following:

- Complete basic operations with word processing software, such as Microsoft Word or Google Docs.
- Understand the basics of spreadsheet software, such as Microsoft Excel or Google Spreadsheets, but having prior computing experience is not necessary.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Student Orientation, found at the beginning of this course.

Credit Value

Texas Biology, Semester A, is a 0.5 credit course.

Course Materials

- notebook
- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent

Course Pacing Guide

This course description and pacing guide is intended to help you keep on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class.

Unit 1: Cells

Summary

At the start of this unit, you'll use the scientific method to investigate a biology question and investigate the nature of scientific theories and laws. You'll learn to use laboratory tools and a compound microscope. You'll also explore the differences between prokaryotic and eukaryotic cells. Toward the end of this unit, you'll learn more about cell processes and transport and study the differences between cells and viruses.

Day	Activity/Objective	Type
1 day: 1	Syllabus and Student Orientation <i>Review the Student Orientation and Course Syllabus at the beginning of this course.</i>	Course Orientation
3 days: 2–4	Introduction to Biology <i>Use the scientific method to investigate a biology question.</i>	Lesson
3 days: 5–7	Scientific Theories and Laws <i>Explain the nature of scientific theories and laws.</i>	Lesson
4 days: 8–11	Using a Microscope <i>Use a compound microscope to investigate structures of different organisms.</i>	Course Activity
3 days: 12–14	Using Laboratory Tools <i>Understand how to safely use laboratory tools for scientific investigations.</i>	Course Activity
3 days: 15–17	Cells: The Basic Units of Life <i>Explain cell theory and the differences between prokaryotic and eukaryotic cells.</i>	Lesson
3 days: 18–20	Cell Processes and Transport <i>Explain how different proteins produced by a cell carry out critical life functions through systems of specialized cells.</i>	Lesson
3 days: 21–23	Cells and Viruses <i>Compare viruses to cells and explore how viruses can cause disease in organisms.</i>	Course Activity
4 days: 24–27	Unit Activity and Discussion—Unit 1	Unit Activity/ Discussion
1 day: 28	Posttest—Unit 1	Assessment

Unit 2: Body Systems

Summary

In this unit, you will develop models to explore the functioning of different body systems and examine how the proper functioning of those body systems affects health. You will also study the effects of exercise on muscles and on heart rate.

Day	Activity/Objective	Type
4 days: 29–32	The Nervous System <i>Develop and use a model to show how the nervous system processes and responds to stimuli from all other body systems.</i>	Lesson
4 days: 33–36	The Skeletal and Muscle Systems <i>Develop and use a model to explain how the musculoskeletal system works with the nervous system for movement and support.</i>	Lesson
4 days: 37–40	The Respiratory and Circulatory Systems <i>Develop a model to show how the circulatory and respiratory systems work together to provide oxygen to the body.</i>	Lesson
4 days: 41–44	The Effects of Exercise on Muscles and Heart Rate <i>Plan and conduct an investigation to explain how exercise affects heart rate and muscle activity.</i>	Course Activity
4 days: 45–48	The Digestive and Excretory Systems <i>Use a model to explain how the digestive and excretory systems interact with the circulatory system to provide energy to cells and eliminate waste.</i>	Lesson
4 days: 49–52	The Integumentary, Immune, Lymph, and Endocrine Systems <i>Use models to explain how the integumentary, immune, lymph, and endocrine systems regulate the body and maintain homeostasis.</i>	Lesson
4 days: 53–56	Human Reproduction and Development <i>Use models to explain how human reproduction is controlled by anatomical and biochemical processes.</i>	Lesson

Day	Activity/Objective	Type
4 days: 57–60	Unit Activity and Discussion—Unit 2	Unit Activity/ Discussion
1 day: 61	Posttest—Unit 2	Assessment

Unit 3: Genetics and Heredity

Summary

In this unit, you will expand your knowledge of the roles of mitosis, meiosis, DNA, and chromosomes in an organism’s growth and development. You will study cell differentiation and specialization. You’ll also research and write a paper that addresses questions about the search for a cure for cancer. Toward end of this unit, you’ll use genetic models, statistics, and probability to learn more about inheritance patterns.

Day	Activity/Objective	Type
3 days: 62–64	Mitosis and Meiosis <i>Use a model to illustrate the role of mitosis and meiosis in producing and maintaining complex organisms.</i>	Lesson
3 days: 65–67	Cell Differentiation and Specialization <i>Explain how instructions in DNA lead to cell differentiation and result in specialized cells in multicellular organisms.</i>	Lesson
2 days: 68–69	Genes: The Heredity Code <i>Ask questions to clarify relationships about the role of DNA and chromosomes in passing traits from parents to offspring.</i>	Lesson
3 days: 70–72	The Cure for Cancer <i>Present evidence to answer questions about the search for a cancer cure.</i>	Course Activity
3 days: 73–75	Genetic Mutations <i>Make and defend a claim based on evidence that inheritable genetic variations may result from genetic mutations.</i>	Lesson
4 days: 76–79	Inheritance Patterns and Genetic Research <i>Use statistics and probability to calculate variation and distribution of expressed traits in a population.</i>	Lesson

Day	Activity/Objective	Type
4 days: 80–83	Genetic Models <i>Develop genetic models to calculate the probability of expressed traits in a population over several generations.</i>	Course Activity
4 days: 84–87	Unit Activity and Discussion—Unit 3	Unit Activity/ Discussion
1 day: 88	Posttest—Unit 3	Assessment
1 day: 89	Semester Review	
1 day: 90	End-of-Semester Test	Assessment

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 for Semester A](#).