

BIOLOGY 1406
Biology for Science Majors I

Western Texas College

- I. Basic Course Information
 - A. Lecture Course Description: Fundamental principles of living organisms will be studied, including physical and chemical properties of life, organization, function, evolutionary adaptation, and classification. Concepts of cytology, reproduction, genetics, and scientific reasoning are included.
 - B. Lab Course Description: The required laboratory activities will reinforce the lecture material.
 - C. Required Co-requisite: MATH 1314 or its equivalent.
 - D. Required grade for enrolling in the next course in this sequence: None
- II. Student Learning Outcomes
 - A. Describe the characteristics of life.
 - B. Explain the methods of inquiry used by scientists.
 - C. Identify the basic requirements of life and the properties of the major molecules needed for life.
 - D. Compare and contrast the structures, reproduction, and characteristics of viruses, prokaryotic cells, and eukaryotic cells.
 - E. Describe the structure of cell membranes and the movement of molecules across a membrane.
 - F. Identify the substrates, products, and important chemical pathways in metabolism.
 - G. Identify the principles of inheritance and solve classical genetic problems.
 - H. Identify the chemical structures, synthesis, and regulation of nucleic acids and proteins.
 - I. Describe the unity and diversity of life and the evidence for evolution through natural selection.
 - J. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
 - K. Use critical thinking and scientific problem solving to make informed decisions in the laboratory.
 - L. Communicate effectively the results of scientific investigations.
- III. Testing Requirements
 - A. On-campus: All exams are given during scheduled lecture time
Online: Standard exams and the final exam must be proctored by an approved testing organization. (Ask your instructor for more details.)
 - B. No outside materials are allowed during standard exams or the final
 - C. All standard exams and the final are timed
- IV. Course Requirements
 - A. 10 multiple-choice quizzes
 - B. 4 long-form responses to prompts based on current science articles

- C. 13 total lab assignments
- D. 3 non-cumulative multiple-choice lecture standard exams
- E. 1 cumulative multiple-choice final exam
- V. Information on Books and Other Course Materials
 - A. Recommended Book: *Biology in Focus, 3rd Edition* by Urry, et al.
ISBN – 0-13-471067-3
 - B. Lab materials are provided
- VI. Grading Breakdown

<i>Types of Assignments</i>	<i>Proctored</i>	<i>Not Proctored</i>
In-Class Assignments	10%	
Chapter Quizzes		10%
Article Questions		10%
Lab	25%	
Semester Exams	20%	
Lecture Final Exam	20%	
Participation	5%	
Total	80%	20%

- VII. Other Policies, Procedures and important Dates. Please refer to the WTC [Catalog](#) for the following
 - A. Campus Calendar
 - B. Final exam schedule
 - C. How to drop a class
 - D. Withdrawal information
 - E. Student Conduct/Academic Integrity
 - F. Students with disabilities
- VIII. Course Content

Weekly Overview	Topics Covered
1 – Introduction to Science and Biology	Common themes of life, introduction to evolutionary theory, the scientific method
2 – The Chemistry of Life	Atoms, chemical bonds, hydrogen bonds, acids and bases, carbohydrates, proteins, lipids, nucleic acids, ATP
3 – Cells and Metabolism	Cell theory, prokaryotic traits, eukaryotic traits, organelles, the cytoskeleton, enzymes,

	metabolic pathways, cell membranes, diffusion, active transport
4 – Photosynthesis and Respiration	Properties of light, light-dependent reactions, light independent reactions, carbon fixation strategies, glycolysis, Krebs cycle, electron transport chain, fermentation
5 – Introduction to Molecular Biology	DNA structure, DNA function, DNA replication, mutations, genes, transcription, translation, RNA structure, RNA function
6 – The Cell Cycle and Genetics	Mitosis, interphase, senescence, cancer, meiosis, sexual reproduction, gene expression, genetic control, Mendelian genetics, epigenetics
7 – Genetics and Biotechnology	Genetic variation, genetic screening, DNA cloning, DNA sequencing, genomics, genetic engineering
8 – Introduction to Evolutionary Theory	Early evolutionary thought, modern evolutionary theory, evidences for evolution
9 – Natural Selection and the Tree of Life	Populations, genetic equilibrium, directional selection, speciation, macroevolution, phylogeny, comparative morphology, comparative molecular approaches, taxonomy
10 – Evolution of Life on Earth	Potential origins of life, environmental conditions of early Earth, protocells, origins of eukaryotes, endosymbiotic theory, vertebrate evolution
11 – Human Evolution	Primate similarities, evolution of hominids, evolution of hominins, causes of human evolution, Out-of-Africa theory

Last Modified: August 21, 2019