

**BIOL 1307**  
**Biology for Science Majors II**

**Western Texas College**

- I. Basic Information
  - A. The diversity and classification of life will be studied, including animals, plants, protists, fungi, and prokaryotes. Laboratory activities will reinforce study of the diversity and classification of life, including animals, plants, protists, fungi, and prokaryotes. Special emphasis will be given to anatomy, physiology, ecology, and evolution of plants and animals.
  - B. Required Pre/Co-requisite: MATH 1314 or its equivalent and BIOL 1107 Lab.
  - C. It is recommended that BIOL 1306/1106, Biology for Science Majors I (Lecture and Laboratory) be taken before BIOL 1307/1107 (Lecture and Laboratory).
  
- II. Student Learning Outcomes
  - A. Describe modern evolutionary synthesis, natural selection, population genetics, micro and macroevolution, and speciation.
  - B. Describe phylogenetic relationships and classification schemes.
  - C. Identify the major phyla of life with an emphasis on plants and animals, including the basis for classification, structural and physiological adaptations, evolutionary history, and ecological significance.
  - D. Describe basic animal physiology and homeostasis as maintained by organ systems.
  - E. Compare different sexual and asexual life cycles noting their adaptive advantages.
  - F. Illustrate the relationship between major geologic change, extinctions, and evolutionary trends
  - G. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
  - H. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
    - I. Effectively communicate the results of scientific investigations.
    - J. Demonstrate knowledge of modern evolutionary synthesis, natural selection, population genetics, micro and macroevolution, and speciation.
  - K. Distinguish between phylogenetic relationships and classification schemes.
  
- 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 module exams and the final are timed

- IV. Course Requirements
- A. 10 multiple-choice quizzes
  - B. 3 non-cumulative multiple-choice and true/false module exams
  - C. 1 cumulative multiple-choice and true/false final exam
  - D. Class participation in the form of discussion and attendance is required.
- V. Information on Books and Other Course Materials
- A. Required Book: *Biology in Focus, 3<sup>rd</sup> Edition* by Urry, et al.  
ISBN: 0-13-471067-3
  - B. Required purchase of lab kit for BIOL 1107 lab.

VI. Grading Breakdown

<i>Types of Assignments</i>	<i>Proctored</i>	<i>Not Proctored</i>
Chapter Quizzes		20%
End of Chapter Questions		15%
Module Exams	25%	
Final Exam	30%	
Participation	5%	
Total	60%	35%

- 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

Chapters Covered	Sections Covered
Chapter 24 – Early Life and the Diversification of Prokaryotes	Prokaryotic cell structures, unique metabolic adaptations, reproduction methods, prokaryotic evolution, environmental role of prokaryotes
Chapter 25 – The Origin and Diversification of Eukaryotes	Eukaryotic origins, development of multicellularity, eukaryotic classification, protists

Chapter 26 – The Colonization of Land

Origin of plants, fungi, plant classifications, land plant adaptations, plant and fungal environmental roles

Chapter 27 – The Rise of Animal Diversity	Origin of animals, Cambrian Explosion, radiative evolution, vertebrate evolution, land animal adaptations, amniote evolution, environmental effects of animals
Chapter 28 – Plant Structure and Growth	Plant organs, plant cells, cell differentiation, primary growth, secondary growth
Chapter 29 – Resource Acquisition, Nutrition, and Transport in Vascular Plants	Key adaptations for resource acquisition, substance transport, root function, symbiotic relationships, water movement, transpiration, sugar movement
Chapter 30 – Reproduction and Domestication of Flowering Plants	Unique structures of angiosperms, flowering plant reproduction, genetic engineering
Chapter 31 – Plant Responses to Internal and External Signals	Plant hormones, plant response to light, plant response to other stimuli, plant defenses
Chapter 32 – The Internal Environment of Animals: Organization and Regulation	Animal homeostasis, feedback control, osmoregulation, kidney function
Chapter 33 – Animal Nutrition	Animal energy needs, food processing, digestive organs, digestive system adaptations, regulation of digestion
Chapter 34 – Circulation and Gas Exchange	Types of circulatory system, mammalian circulatory system, artery and vein function, components of blood, gas exchange organs, mechanics of breathing
Chapter 35 – The Immune System	Innate immunity, adaptive immunity
Chapter 36 – Reproduction and Development	Asexual reproduction, adaptations for sexual reproduction, reproductive organs, reproduction regulation in mammals, embryology
Chapter 37 – Neurons, Synapses, and Signaling	Neuron structure, action and resting potential, synapse function
Chapter 38 – Nervous and Sensory Systems	Regions of the brain, brain function, sensory function, special senses

Chapter 39 – Motor Mechanisms and Behavior	Muscle structure and function, behavioral integration, learning, evolutionary explanations of diverse behavior
Chapter 40 – Population Ecology and the Distribution of Organisms	Climate and terrestrial biomes, aquatic biomes, organismal interactions, population growth models, life history traits
Chapter 41 – Species Interactions	Intercommunal interactions, trophic structures, species diversity, biogeographic factors
Chapter 42 – Ecosystems and Energy	Laws of energy flow, primary production, energy transfer, nutrient and water cycling
Chapter 43 – Global Ecology and Conservation Biology	Human impacts on biodiversity, population conservation, human impacts on Earth, climate change, human population concerns, sustainable development

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