

**Biology 1407**  
**Biology for Science Majors II**

**Western Texas College**

- I. Basic Information
  - A. Lecture-- 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. Lab—The required laboratory activities will reinforce the lecture material.
  - C. Pre-requisite: MATH 1314 or 1414. Successful completion of College Algebra or concurrent enrollment in higher-level mathematics is recommended. It is recommended that BIOL 1406, Biology for Science Majors I (Lecture and Laboratory) be taken before BIOL 1407.
- 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. Communicate effectively 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. The Chapter Test and Final exam must be proctored by an approved testing organization. (Ask you instructor for more details.)
  - B. Students are NOT allowed to use their book or notes of any kind while taken their proctored tests and exam.

- C. All Chapter Tests and the comprehensive Lab and Lecture Final Exams are timed.
- IV. Course Requirements
  - A. 10 multiple-choice quizzes
  - B. 4 current science article write-ups and associated class discussion
  - C. 10 total lab assignments
  - D. 3 non-cumulative multiple-choice chapter tests
  - E. 1 cumulative multiple-choice final exam
- V. Information on Books and Other Course Materials
  - A. Required Book: *Biology in Focus, 2nd Edition* by Urry, et al. - ISBN – 0-321-96275-3
  - B. Lab materials are provided
- VI. Grading Breakdown
  - A. Articles.....15%
  - B. Quizzes.....10%
  - C. Lab.....30%
  - D. Chapter Tests.....25%
  - E. Final Exam.....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

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

Last Modified: January 16, 2018