

This is a SouthArk Master Syllabus. The course syllabus distributed by the instructor may include additional requirements, must be followed by the student in the given term, and is considered to supersede the Master Syllabus.

Course Number

BIOL1114 /L equivalent to ACTS course BIOL 1014/L

Course Title

Biology for Majors/Lab

Course Description

A study of the principles of biology. Provides the foundation for other advanced courses in the biological sciences. Includes an in-depth study of fundamental biological concepts including the scientific process, classification, structure and functions, cellular metabolism, evolution, and genetics. Appropriate for biology and health science majors, as well as general education. Lab required.

College Mission

South Arkansas Community College promotes excellence in learning, teaching, and service; provides lifelong educational opportunities; and serves as a cultural, intellectual, and economic resource for the community.

College Wide Student Learner Outcomes

Critical Thinking Responsibility Communication

ACTS Course **Program Course**

ACTS Outcomes

Expected Student Learning Outcomes: The student will explain, describe, discuss, recognize, and/or apply knowledge and understanding of the following:

1. Scientific method
2. Classification
3. Cell and membrane structure and functions
4. Biochemistry
5. Enzymes
6. Respiration and photosynthesis
7. Mitosis and meiosis
8. Metabolism
9. Genetics
10. DNA
11. Evolution
12. Use of microscope and other lab equipment

Program Outcomes

Course Learner Outcomes

CLO #	Course Learner Outcomes	Unit Outcomes/ Competencies	ACTS Outcomes	Program Outcomes	Critical Thinking	Communication	Responsibility	Assessment
CLO 1	Explain the scientific method and how it's used to reveal an accurate understanding of living things; be able to distinguish information	Ch.1.01 - Ch.1.04	1		*CT4			Exam I

	resulting from scientific inquiry from that based on anecdotes and deceptive, non-scientific studies.							
CLO 2	Describe the chemistry of living things and relate biochemicals and their reactions to energy transformations between organisms and their environments; explain the conversion of light energy to chemical energy resulting in the connection between producers and consumers.	Ch.2.00- Ch.2.06; Ch.4.01 - Ch.6.09; Ch.6.06- Ch.6.07	4,5,6, 8		CT4			Exam I
CLO 3	Describe the variation of cell structures among organisms and contrast them with non-living particles such as viruses; explain how cell anatomy and function impacts the organism as a whole.	Ch.3.00 - Ch.3.07	3		CT4			Exam I
CLO 4	Explain the various ways that cells reproduce and how they relate to DNA replication and inheritance; relate molecular, chromosomal, and cellular activities to genetic variation and evolutionary change.	Ch.7.02- Ch.7.06; Ch.8.00 - Ch.10.05; Ch.11.01- Ch.11.04; 13.06	7,9, 10		CT4			Exam II
CLO 5	Understand the process of gene expression and regulation and how gene products result in the characteristics of organisms; describe how these genetic processes contribute to adaptive change from generation to generation.	Ch.7.02- Ch.7.06;	9		CT4			Exam II
CLO 6	Understand commonly used biotechnologies, recognize their practical applications and ability to reveal evolutionary relationships and change; recognize the responsibility associated with the correct use and interpretation of these technologies..	Ch.12.00- Ch.14.01; Ch.16.01; Ch.17.11- Ch.17.13	11		CT4			Exam II
CLO 7	Understand the role of selection, mutation, and genetic drift in evolutionary processes and recognize the scientific evidence of evolution; provide examples that demonstrate evolution as an ongoing process and recognize that diversity is the result of evolutionary adaption to environmental pressures.	Ch.12.00- Ch.14.01; Ch.16.01; Ch.17.11- Ch.17.13	9, 11		CT4			Exam II
CLO 8	Understand that scientists have a taxonomic framework to help with classification of living organisms, based on phylogeny, in place for grouping organisms according to ancestral relationships and that this framework is constantly being refined as new information becomes available.	Ch.14.00 - Ch.14.07	2		CT4			Exam III
CLO 9	Describe relationships that exist between different organisms and between organisms and their environments; provide and describe	Ch.18.00- Ch.20.07			CT4			Exam IV

	examples of various types of these ecological relationships.						
CLO 10	Understand the effects of anthropogenic activities on the biosphere including climate change and ocean acidification.	Ch.18.00- Ch.20.07			CT4		Exam IV
CLO 11	Describe lab safety steps to be followed at times the student is in the lab and is using lab equipment.	Lab	12			*R2	Quiz I

*CT4 – Scientific Reasoning; *R2 – Safety in the lab.

Unit Outcomes/ Competencies/ Objectives for the Lecture and Lab

Unit 1

CLO 1 Explain the scientific method and how it's used to reveal an accurate understanding of living things be able to distinguish information resulting from scientific inquiry from that based on anecdotes and deceptive, non-scientific studies.

CLO 2 Describe the chemistry of living things and relate biochemicals and their reactions to energy transformations between organisms and their environments; explain the conversion of light energy to chemical energy resulting in the connection between producers and consumers.

CLO 3 Describe the variation of cell structures among organisms and contrast them with non-living particles such as viruses; explain how cell anatomy and function impacts the organism as a whole.

After reading and studying the textbook unit 1, students should be able to do the following.

Chapter 1

01.01.01 Describe the characteristics that all living organisms share.

01.02.01 Compare and contrast the three branches of life.

01.03.01 Identify standardized, dependent, and independent variables in an experiment.

01.03.02 Apply the scientific method to design experiments and analyze data.

01.03.03 Discuss the limitations of the scientific method.

01.04.01 Explain how observations of orchids and moths confirmed a prediction of evolutionary theory.

Chapter 2

02.00.01 Explain the chemical nature of biological molecules.

02.01.01 Identify the most important elements in living organisms.

02.01.02 Describe the structure of atoms.

02.02.01 Compare and contrast the different types of bonds.

02.02.02 Differentiate between atoms, molecules, and compounds.

02.03.01 Explain how the structure of water affects its chemical properties.

02.04.01 Explain how acids and bases affect pH.

02.05.01 Explain the relationship between monomers and polymers.

02.05.02 Compare and contrast the structures and functions of the four classes of biological molecules.

02.06.01 Explain how researchers used isotopes to test hypotheses about the extraterrestrial origin of organic molecules.

Chapter 3

03.00.01 Describe the properties of a cell.

03.01.01 Explain How different types of microscopes contribute to scientific understanding of cell structure.

03.01.02 Define a cell using the components of cell theory.

03.01.03 Identify the components common to all cells.

03.02.01 Compare and contrast the cells that characterize the three domains of life.

03.03.01 Explain how the chemical structure of phospholipids enables them to form a bilayer in water.

03.03.02 Identify different functions of membrane proteins.

03.04.01 Identify the functions of the organelles in eukaryotic cells.

03.04.02 Describe how organelles interact in carrying out a cell's function.

03.05.01 Compare and contrast the structure and function of cytoskeletal proteins.

03.06.01 Explain the function of plasmodesmata in plant cells.

03.06.02 Compare and contrast different cell junctions in animal cells.

03.07.01 Explain how researchers used genetic mutations and microscopes to investigate the origin of the cytoskeleton.

Chapter 4

04.01.01 Describe how cells use energy to do work.

04.01.02 Compare and contrast potential and kinetic energy.

- 04.01.03 Explain how physical laws constrain energy use in organisms.
- 04.02.01 Explain the relationship between reactions that absorb energy and those that release energy.
- 04.02.02 Explain how oxidation and reduction reactions are linked.
- 04.03.01 Explain how ATP is used in coupled reactions.
- 04.04.01 Explain how enzymes catalyze reactions.
- 04.04.02 List the factors that influence enzyme activity.
- 04.05.01 Compare and contrast the ways that molecules move across membranes.
- 04.05.02 Explain the relationship between diffusion and concentration gradients.
- 04.06 .01 Use natural selection to explain how cystic fibrosis is maintained in the human population.

Chapter 5

- 05.01.01 Explain the importance of photosynthesis in ecosystems.
- 05.01.02 Draw and describe the net reaction in photosynthesis.
- 05.02.01 Explain how light interacts with pigments.
- 05.03.01 Describe the structures in a leaf that are involved in photosynthesis.
- 05.04.01 Compare and contrast the light and carbon reactions of photosynthesis.
- 05.05.01 Describe how the light reactions produce ATP and NADPH.
- 05.05.02 Explain the role of H₂O in photosynthesis.
- 05.06.01 Identify the products and reactants in the carbon reactions.
- 05.06.02 Explain the relationship between the products and reactants of the light and carbon reactions.
- 05.07.01 Compare and contrast C₃, C₄, and CAM plants.
- 05.08.01 Explain how researchers used DNA evidence to learn how chloroplasts carry out photosynthesis in sea slugs.

Chapter 6

- 06.01.01 Explain how cells use energy in food to produce ATP.
- 06.01.02 Draw and explain the net reaction in aerobic respiration.
- 06.02.01 Compare and contrast the events of glycolysis, the Krebs cycle, and the electron transport chain.
- 06.03.01 Describe where in a eukaryotic cell each step in respiration occurs.
- 06.04.01 Draw and explain the net reaction in glycolysis.
- 06.05.01 Draw and explain the net reaction in the Krebs cycle.
- 06.05.02 Diagram and explain the flow of electrons in the electron transport chain.
- 06.05.03 Explain the role of O₂ in respiration.
- 06.06.01 Calculate the net ATP produced in aerobic metabolism.
- 06.07.01 Compare and contrast where carbohydrates, fats, and proteins enter metabolism.
- 06.08.01 Compare and contrast aerobic respiration and fermentation.
- 06.09.01 Use natural selection to explain why beetles visit “hot” flowers.

Unit 2

CLO 4 Explain the various ways that cells reproduce and how they relate to DNA replication and inheritance; relate molecular, chromosomal, and cellular activities to genetic variation and evolutionary change.

CLO 5 Understand the process of gene expression and regulation and how gene products result in the characteristics of organisms; describe how these genetic processes contribute to adaptive change from generation to generation.

CLO 6 Understand commonly used biotechnologies, recognize their practical applications and ability to reveal evolutionary relationships and change; recognize the responsibility associated with the correct use and interpretation of these technologies.

After reading and studying the textbook unit 2, students should be able to do the following.

Chapter 7

- 07.01.01 Identify the components of double---stranded DNA.
- 07.01.02 Explain how hydrogen bonds contribute to the structure of DNA.
- 07.01.03 Use a template strand of nucleotides to create a complementary strand.
- 07.02.01 Explain the roles of DNA, RNA, and protein in gene function.
- 07.03.01 Describe the events in transcription.
- 07.03.02 Explain how RNA is processed during transcription.
- 07.04.01 Describe the events in translation.
- 07.04.02 Use the genetic code to translate a nucleic acid sequence into protein.
- 07.04.03 Diagram and explain the relationship between codons and amino acids.
- 07.05.01 Explain how the transcription of a gene is regulated.
- 07.05.02 Compare and contrast prokaryotic and eukaryotic gene regulation.
- 07.06.01 Compare and contrast how substitution, insertion, and deletion mutations can alter a protein.
- 07.06.02 Explain when a mutation can be passed on to the next generation.
- 07.07.01 Describe the general structure of viruses.

- 07.07.02 Describe the major stages of viral replication in a host cell.
- 07.08.01 Contrast the difference between the lytic and the lysogenic cycles of viruses.
- 07.08.02 Explain how viruses cause disease in animals.
- 07.08.03 Explain how viruses cause disease in plants.
- 07.09.01 Describe how drugs and vaccines help fight diseases caused by viruses.
- 07.10.01 Explain how prions and viroids cause disease.
- 07.11.01 Explain how researchers used molecular data to learn about the evolution of human language.

Chapter 8

- 08.00.01 Explain how cells divide to give rise to identical cells.
- 08.01.01 Identify the roles of mitosis, meiosis, and fertilization in the human life cycle.
- 08.01.02 Define apoptosis.
- 08.02.01 Describe the steps of DNA replication and the function of enzymes in each step.
- 08.02.02 Explain what features of DNA allow semiconservative replication to occur.
- 08.03.01 Describe the events of binary fission in prokaryotic cells.
- 08.04.01 Describe how DNA folds into a visible chromosome.
- 08.05.01 Explain what is happening in a eukaryotic cell at each stage of the cell cycle.
- 08.05.02 Diagram and identify the phases in mitosis.
- 08.06.01 Explain how cell cycle checkpoints relate to cancer.
- 08.06.02 List some of the factors that increase the risk for developing cancer.
- 08.06.03 Describe the most common treatments for cancer.
- 08.07.01 Apply the concept of natural selection to the development of drug resistance in a tumor.

Chapter 9

- 09.00.01 Explain how genetic information is passed from one generation to the next.
- 09.01.01 Compare and contrast sexual and asexual reproduction.
- 09.02.01 Distinguish between autosomes and sex chromosomes.
- 09.02.02 Describe the role of homologous chromosomes in sexual reproduction.
- 09.03.01 Explain the roles of meiosis, gamete formation, and fertilization in sexual reproduction.
- 09.03.02 Differentiate between haploid and diploid cells.
- 09.03.03 Explain the roles of somatic cells and germ cells in sexual reproduction.
- 09.04.01 Sketch and identify the steps in meiosis.
- 09.05.01 List and explain three ways that meiosis generates genetic variability among offspring.
- 09.05.02 Compare and contrast the effects of crossing over, independent assortment, and random fertilization on variability among offspring.
- 09.06.01 Compare and contrast mitosis and meiosis.
- 09.07.01 Diagram and explain how polyploidy and nondisjunction can lead to missing or extra chromosomes in a gamete.
- 09.08.01 Explain how researchers investigated the recent origin of two plant species.

Chapter 10

- 10.00.01 Explain how genetic traits are passed from one generation to the next.
- 10.01.01 Describe the role of chromosomes in inheritance.
- 10.01.02 Differentiate between the terms gene, allele, locus and chromosome.
- 10.01.03 Explain how meiosis and the production of gametes are associated with inheritance.
- 10.02.01 Explain the relationship between dominant and recessive alleles of a gene.
- 10.02.02 Compare and contrast genotype and phenotype.
- 10.02.03 Differentiate between homozygous and heterozygous.
- 10.03.01 Use a Punnett square to diagram and explain a monohybrid cross.
- 10.03.02 Explain how meiosis contributes to Mendel's law of segregation.
- 10.04.01 Use a Punnett square to diagram and explain independent assortment in a dihybrid cross.
- 10.04.02 Explain how meiosis contributes to independent assortment of alleles.
- 10.04.03 Use the product rule to predict inheritance patterns for two or more genes.
- 10.05.01 Describe how linked genes produce inheritance patterns that do not appear to follow Mendel's laws.
- 10.05.02 Diagram how crossing over can separate linked genes.

Chapter 11

- 11.01.01 List examples of applications of DNA technology.
- 11.02.01 Outline the steps required to make a transgenic organism.
- 11.02.02 Describe DNA sequencing, the polymerase chain reaction, and DNA profiling techniques.
- 11.02.03 Give examples of human DNA functions other than encoding proteins.
- 11.03.01 Compare and contrast the growth of a normal cell and a stem cell.
- 11.03.02 Explain how cloning is different from sexual reproduction.
- 11.04.01 Describe how gene probes help biologists specify DNA sequences.

11.04.02 Compare and contrast preimplantation genetic diagnosis, genetic testing, and gene therapy.

11.04.03 Identify ethical issues associated with the use of DNA technology in medicine.

11.05.01 List examples of ways biologists can use genomic sequences to learn about evolution.

Unit 3

CLO 6 Understand commonly used biotechnologies, recognize their practical applications and ability to reveal evolutionary relationships and change; recognize the responsibility associated with the correct use and interpretation of these technologies.

CLO 7 Understand the role of selection, mutation, and genetic drift in evolutionary processes and recognize the scientific evidence of evolution; provide examples that demonstrate evolution as an ongoing process and recognize that diversity is the result of evolutionary adaptation to environmental pressures.

CLO 8 Understand that scientists have a taxonomic framework, based on phylogeny, in place for grouping organisms according to ancestral relationships and that this framework is constantly being refined as new information becomes available.

After reading and studying the textbook unit 3, students should be able to do the following.

Chapter 12

12.00.01 Explain the forces that drive microevolution.

12.01.01 Explain the relationship between evolution, allele frequencies, and populations.

12.02.01 Summarize the evidence Darwin used to develop his theory of evolution by natural selection.

12.03.01 Explain the link between natural selection and reproductive success.

12.04.01 Use the Hardy-Weinberg Equation to calculate allele and genotype frequencies.

12.05.01 Explain how natural selection can affect allele frequencies.

12.05.02 Compare and contrast directional, stabilizing, and disruptive selection.

12.05.03 Explain how natural selection can maintain harmful alleles in a population.

12.06.01 Explain how sexual selection can promote traits that seem to decrease survival.

12.07.01 Compare and contrast how mutation, genetic drift, nonrandom mating, and gene flow contribute to evolution.

12.08.01 Predict how changes in fishing regulations might affect the evolution of fish populations.

Chapter 13

13.01.01 List the lines of evidence that support evolutionary theory.

13.02.01 Explain why hard body parts are more likely to appear in the fossil record.

13.02.02 Describe two ways that the age of a fossil can be determined.

13.03.01 Explain how biogeography can be used to explain the evolution of a species.

13.04.01 Compare and contrast homologous, vestigial, and analogous structures.

13.05.01 Explain how embryonic development can reveal evolutionary relationships.

13.06.01 Describe how DNA sequences can reveal evolutionary relatedness.

13.06.02 Explain the use of a molecular clock to estimate when two species diverged.

13.07.01 Describe the evidence that suggests that snakes evolved on land from four-legged ancestors.

Chapter 14

14.00.01 Describe the forces that lead to the evolution of new species.

14.01.01 Compare and contrast microevolution and macroevolution.

14.01.02 Define a biological species.

14.02.01 Compare and contrast several forms of prezygotic and postzygotic barriers to reproduction.

14.03.01 Compare and contrast allopatric and sympatric speciation.

14.04.01 Compare and contrast gradualism and punctuated equilibrium.

14.05.01 Identify factors that can affect the extinction rate of species.

14.06.01 Name the levels of the taxonomic hierarchy from domain to species.

14.06.02 Interpret a phylogenetic tree to determine relationships among species.

14.07.01 Explain how researchers investigated pollinator preferences as a reproductive barrier in plants.

Chapter 15

15.01.01 Summarize the evidence for the origin of life on Earth.

15.01.02 Describe how conditions on the early Earth could contribute to the production of biological molecules.

15.01.03 Explain why RNA may have been the first form of genetic material.

15.02.01 Describe the characteristics of bacteria.

15.02.02 Identify the features and functions of structures found in bacteria.

15.02.03 Differentiate and compare archaea with bacteria.

15.02.04 Describe how prokaryotes interact with other species in the environment.

15.03.01 Diagram and describe how endosymbiosis contributed to the evolution of eukaryotes.

- 15.03.02 Explain how multicellular eukaryotic organisms may have evolved.
- 15.04.01 Describe the characteristics common to all protists.
- 15.04.02 Understand why the protists are the most diverse eukaryotic kingdom.
- 15.04.03 Describe the characteristics of autotrophic protists.
- 15.04.04 Describe the characteristics of slime molds and water molds.
- 15.04.05 Describe the characteristics of protozoa.
- 15.05.01 Describe the characteristics common to all fungi.
- 15.05.02 Compare and contrast the five phyla of fungi.
- 15.05.03 Explain the role of hyphae and spores in the life cycle of fungi.
- 15.05.04 Explain how fungi interact with other organisms, living and dead.
- 15.06.01 Explain how researchers tested the hypothesis that fungal endophytes protect plants from disease.

Chapter 16

- 16.01.01 Describe the characteristics common to all plants.
- 16.01.02 Explain the evidence supporting the evolution of plants from green algae.
- 16.01.03 Understand the adaptations of plants to terrestrial habitats.
- 16.01.04 Describe alternation of generations in each of the major plant phyla.
- 16.02.01 Describe the features and reproductive adaptations of mosses and other bryophytes.
- 16.03.01 Describe the features and reproductive adaptations of ferns and other seedless vascular plants.
- 16.04.01 Describe the features and reproductive adaptations of conifers and other gymnosperms.
- 16.05.01 Differentiate between the two main angiosperm clades.
- 16.05.02 Understand how reproduction differs between gymnosperms and angiosperms.
- 16.05.03 Explain the interaction of flowers and fruits with animals in angiosperm reproduction.
- 16.06.01 Explain how researchers use DNA sequences to reconstruct ancient ecosystems.

Chapter 17

- 17.01.01 Describe the characteristics common to all animals.
- 17.01.02 List the criteria biologists use to classify animals.
- 17.02.01 Describe the characteristics of sponges.
- 17.02.02 Explain how the feeding and reproductive strategies in sponges are unique.
- 17.03.01 Describe the characteristics of cnidarians.
- 17.03.02 Explain how the body plan and reproductive strategies in cnidarians are unique.
- 17.04.01 Describe the characteristics of flatworms.
- 17.04.02 Explain how the body shape of a flatworm affects its respiratory and circulatory systems.
- 17.05.01 Describe the characteristics of mollusks.
- 17.05.02 Describe the differences in body plan, reproduction, feeding, and respiration among the gastropods, bivalves, and cephalopods.
- 17.06.01 Describe the characteristics of annelids.
- 17.06.02 Describe how annelids feed, move, and reproduce.
- 17.07.01 Describe the characteristics of roundworms.
- 17.07.02 Compare and contrast the anatomy of roundworms, flatworms, and annelids.
- 17.08.01 Describe the characteristics of arthropods.
- 17.08.02 Describe the unique anatomical structures of arthropods compared to worms and mollusks.
- 17.08.03 List the four main groups of arthropods and describe the features of each.
- 17.09.01 Describe the characteristics of echinoderms.
- 17.09.02 Understand the importance of the echinoderm water vascular system.
- 17.10.01 Describe the four principal characteristics of chordates.
- 17.10.02 Apply the characteristics used to classify chordates.
- 17.11.01 Describe the characteristics of tunicates, lancelets, and hagfishes.
- 17.11.02 Describe the characteristics of fishes.
- 17.11.03 Describe the importance of lobe-finned fish to the evolution of tetrapods.
- 17.11.04 Understand how amphibians differ from the other terrestrial vertebrates.
- 17.11.05 Describe how reptiles are adapted to terrestrial habitats.
- 17.11.06 Differentiate among monotremes, marsupials, and placental mammals.
- 17.12.01 Describe the evidence supporting human evolution.
- 17.13.01 Explain the significance of fossils in understanding the evolution of tetrapods.

Unit 4

CLO 9 Describe relationships that exist between different organisms and between organisms and their environments; provide and describe examples of various types of these ecological relationships.

CLO 10 Understand the effects of anthropogenic activities on the biosphere including climate change and ocean acidification.

After reading and studying the textbook unit 4, students should be able to do the following.

Chapter 18

- 18.00.01 Describe the factors that affect the size of a population.
- 18.01.01 Compare and contrast population, community, ecosystem, and biosphere.
- 18.02.01 Define population density.
- 18.03.01 Describe how birth and death rates influence a population.
- 18.03.02 Predict the future growth of a population from its age structure.
- 18.03.03 Compare and contrast the three types of survivorship curves.
- 18.04.01 Compare and contrast exponential and logistic growth models.
- 18.04.02 Define carrying capacity and understand how it can affect population size.
- 18.04.03 Compare and contrast density--dependent and density---independent factors that affect population growth.
- 18.05.01 Compare and contrast opportunistic and equilibrium life history adaptations.
- 18.06.01 Describe the factors that affect human population growth rates in different regions of the world.
- 18.07.01 Explain ow researchers determined the function of a firefly's flash.

Chapter 19

- 19.00.01 Explain the interactions in communities and ecosystems.
- 19.01.01 Distinguish between biotic and abiotic interactions in an ecosystem.
- 19.02.01 Explain what determines the location and characteristics of biomes.
- 19.02.02 Explain how Earth's curvature and the tilt of Earth's axis affect climate.
- 19.03.01 Explain how temperature and precipitation affect the location of the terrestrial biomes.
- 19.03.02 Describe the overall characteristics of the major terrestrial biomes.
- 19.03.03 Compare and contrast the different freshwater biomes.
- 19.03.04 Describe the types of organisms that occur in four marine and coastal biomes.
- 19.04.01 Compare and contrast competition, mutualism, commensalism, parasitism, herbivory, and predation.
- 19.04.02 Describe competitive exclusion.
- 19.04.03 Explain how species interactions can lead to coevolution.
- 19.04.04 Describe and give examples of the importance of a keystone species.
- 19.05.01 Explain measures of diversity in biological communities.
- 19.05.02 Compare and contrast primary and secondary succession ecosystem.
- 19.06.02 Interpret a food web to explain energy transfer between trophic levels.
- 19.06.03 Explain the roles of producers, consumers and decomposers in an ecosystem.
- 19.06.04 Explain why the number of trophic levels in a community is limited.
- 19.06.05 Explain the link between food webs and biomagnification.
- 19.07.01 Describe and diagram the four primary biogeochemical cycles.
- 19.08.01 Explain how researchers demonstrated the benefits of a symbiosis involving a plant, a fungus, and a virus.

Chapter 20

- 20.00.01 Explain factors that affect biodiversity.
- 20.01.01 Describe biodiversity and its importance to ecosystems.
- 20.02.01 Explain how habitat loss contributes to loss of biodiversity.
- 20.03.01 Explain how water and air pollution affect biodiversity.
- 20.04.01 Describe the relationship between atmospheric CO₂ and global climate change.
- 20.04.02 Explain how climate change can affect biodiversity.
- 20.05.01 Explain how exotic species can affect biodiversity.
- 20.05.02 Explain how overexploitation can affect biodiversity.
- 20.06.01 Describe conservation tools that can preserve biodiversity.
- 20.07.01 Explain how researchers used climate data to test hypotheses about amphibian extinction.

Lab - Describe lab safety steps to be followed at times the student is in the lab and is using lab equipment.

Assessment Description

Three agreed upon SouthArk assessment questions per chapter are added on to the end of each lecture exam and % success is recorded.

Materials and Technological Requirements

"*Biology: The Essentials.*" Marielle Hoefnagels, 2nd edition (2016). McGraw-Hill Publishing.
ISBN-13: 978-0078024252; ISBN-10: 0078024250.

Laboratory Text- None Required

Other Study Aids: Merriam Webster Dictionary online - www.m-w.com

Class Attendance Policy

Students are expected to attend all classes in which they are enrolled. If a student is absent from a class session, it is the student's responsibility to make arrangements to complete or make up any work missed. No make-up work for missed classes will be allowed without the approval of the instructor. Students who enroll late must assume all responsibility for work missed. Classes not attended as a result of late enrollment may be counted toward excessive absences. Students not attending the entire class period may be counted absent for that period. An instructor may drop students with a grade of "WE" if students have been absent for an excessive number of days. Warning letters will be sent to the students advising them of the consequences of nonattendance and urging them to contact their instructors immediately. Excessive absences are defined as follows:

Regular Semester

Courses which meet once a week2 absences
Courses that meet twice per week3 absences
Courses that meet four times per week.....5 absences

Summer Session

Courses that meet four times per week in a five week session3 absences
Courses which meet two evenings per week in a 10 week session.....3 absences

Students enrolled in special programs or individualized instruction should contact their program director/instructor regarding specific attendance requirements for the program/course. Some of the selective-admission, health-science programs have specific criteria regarding attendance. Students are encouraged to refer to program policies in these matters.

Jury Duty/Military/Official School Function

Scheduled absences are those that occur due to college-related activities or as a result of summons to jury duty or military duty. Classes missed as a result of scheduled absences will not be counted as excessive absences if the instructor is notified and provided documentation prior to the absence(s). Make-up work for scheduled absences will be at the discretion of the instructor.

In all instances, documentation must be provided to the instructor within 24 hours of receipt. Documentation should come from an appropriate party on letterhead or other official stationery with a signature and contact information. Documentation should list the corresponding dates of the leave.

Medical leave

For medical-related absences, documentation must include written notice from the treating medical professional documenting time needed off related to medical reasons and time student may resume classes. The medical reason does not need to be listed on the documentation; the documentation must include only that there is a medical reason, the amount of time the student needs to be absent, and the time the student should be able to return to classes. Students who elect to work at home while on excused leave must meet with their instructors to make arrangements to do so. Working on coursework while on medical leave is not a requirement but can be requested by students. If students request that they be allowed to work at home while on an excused leave, the instructor will make every reasonable effort to ensure that the student is able to do so.

For students who have a medical condition necessitating time off or accommodation:

- 1) They may work at home on assignments if they choose to if on medical leave approved by a medical professional
- 2) Receive appropriate accommodations related to coursework (i.e., excused from labs with potentially harmful chemicals, have a larger desk, etc.)
- 3) Resume their studies where they left off once they return to classes
- 4) Be allowed to make up any missed work related to medical leave
- 5) Receive incompletes on their transcripts until coursework is completed, according to the incomplete grade contract.
- 6) Be given a reasonable time frame in which to complete missed coursework

Academic Honesty Policy

Students enrolled at South Arkansas Community College are expected at all times to uphold standards of integrity. Students are expected to perform honestly and to work in every way possible to eliminate academic dishonesty. Academic dishonesty includes cheating and plagiarism, which are defined as follows:

- Cheating is an attempt to deceive the instructor in his/her effort to evaluate fairly an academic exercise. Cheating includes copying another student's homework, class work, or required project (in whole or in part) and/or

presenting another's work as the student's own. Cheating also includes giving, receiving, offering, and/or soliciting information on a quiz, test, or examination.

- Plagiarism is the copying of any published work such as books, magazines, audiovisual programs, electronic media, and films or copying the theme or manuscript of another student. It is plagiarism when one uses direct quotations without proper credit or when one uses the ideas of another without giving proper credit. When three or more consecutive words are borrowed, the borrowing should be recognized by the use of quotation marks and proper parenthetical and bibliographic notations.

If, upon investigation, the instructor determines that the student is guilty of cheating or plagiarism, the following penalties will apply:

- The student will receive a penalty of no less than a zero on the work in question.
- The instructor will submit a Student Academic Misconduct Form, written report of the incident, to the appropriate dean.
- The dean will submit form to Vice President for Learning to determine disciplinary action.
- The Vice President for Learning will determine whether further disciplinary action will be taken.
- All decisions may be appealed for review through the college's academic appeals procedure.

Equal Opportunity-Affirmative Action Statement

South Arkansas Community College does not discriminate on the basis of age, race, color, creed, gender, religion, marital status, veteran's status, national origin, disability, or sexual orientation in making decisions regarding employment, student admission, or other functions, operations, or activities.

Library Services

Library Homepage: <http://southark.libguides.com/homepage> Library Contact: LibraryStaff@southark.edu or 870.864.7115

Procedures to Accommodate Students with Disabilities:

If you need reasonable accommodations because of a disability, please report this to the Vice President of Student Services with proper documentation. . VPSS Contact: 870.875.7262

The Early Alert System

In an effort to ensure student retention and success, South Arkansas Community College employs an Early Alert System to identify and support at-risk students as soon as possible in a given semester. The intent of Early Alert is to provide this assistance while there is still time to address behaviors or issues that have the potential of preventing students from completing their courses and degree plans. Students referred through the Early Alert System will be required to work on a corrective action plan with their student advising coach and to include attendance accountability and mandatory academic tutoring either in the academic division or in the Testing and Learning Center (TLC).

Once the Student Advising Coach has met with the referred student, and again when the student has met the prescribed corrective actions, the coach will update the Early Alert System so that the instructor is kept informed of the progress in resolving issues.

Behavioral Review Team

At South Arkansas Community College (SouthArk), we are committed to proactive leadership in student wellbeing and campus safety. By focusing on prevention and early intervention with campus situations that involve any person experiencing distress or engaging in harmful or disruptive behaviors, the BRT will serve as the coordinating hub of existing resources to develop intervention and support strategies and offer case management. Students, faculty, staff, and campus guests are encouraged to report any person on campus who is a concern. BRT Contact: 870.875.7262 BRT@southark.edu

Date of Revision: 10/15/2016