ARIZONA WESTERN COLLEGE
SYLLABUS

BIO 100 BIOLOGY CONCEPTS/GE
Credit Hours: 4 Lec: 3 Rec: 1 Lab: 2

PREREQUISITE: None

NOTE: This course will not count toward a major in the life sciences (biology, botany, or zoology). Credit cannot be received in both BIO 100 and the BIO 181-182 sequence.

COURSE DESCRIPTION
A one-semester introductory course covering basic principles and concepts of biology. Methods of scientific inquiry and behavior of matter and energy in biological systems are explored.

1. COURSE GOALS
   - 1.1 Describe the nature of science and the process of scientific study.
   - 1.2 Develop a concept of the organization of life, from the subatomic level up to the ecosystem level.
   - 1.3 Describe the importance of the interactions between the living organisms and the nonliving physical environment in shaping the ecosystem.
   - 1.4 Summarize the similarities that unite all organisms despite the great diversity of life we see on earth.
   - 1.5 Discuss how an understanding of biology can add a useful and interesting perspective to one's personal view of the world.
   - 1.6 Apply the concepts learned in order to make intelligent decisions concerning problems and ethical issues of modern life: personal health, local and global dangers to the environment, extinction of species, human population growth, food production, and new biotechnologies in medicine, human reproduction and genetic engineering.
   - 1.7 Write more effectively communicating the concepts learned in this course.

2. OUTCOMES
   Upon satisfactory completion of this course, students will be able to:
   - 2.1 describe the scientific method and how a controlled experiment is used to test a hypothesis.
   - 2.2 list the features that characterize living things.
   - 2.3 describe the organization of an atom and how atoms form bonds.
   - 2.4 list the properties of water and their importance to life.
   - 2.5 name the four major groups of biological molecules and describe their components, structure, and properties.
   - 2.6 list the tenets of the cell theory.
   - 2.7 differentiate between eukaryotic and prokaryotic cells and describe the advantages of specialization in eukaryotic cells.
   - 2.8 identify the cellular organelles and state the function of each.
   - 2.9 describe types of active and passive transport, and explain how each functions to move substances in biological systems.
   - 2.10 state the tenets of the laws of thermodynamics and their implications for living systems.
   - 2.11 describe how the ATP molecule is formed and its role in energy transfer.
   - 2.12 summarize major processes in photosynthesis and cellular respiration, stating where each takes place in the cell and listing their products.
   - 2.13 list the stages of mitosis and meiosis and describe the purpose of each.
   - 2.14 compare properties of RNA and DNA.
   - 2.15 explain how the DNA molecule replicates.

2.16 describe how chromosomes direct production of proteins via transcription and translation.
2.17 describe Mendel's principles and how his experimental crosses illustrate each.
2.18 use a Punnett square to predict phenotypic and genotypic ratios of crosses.
2.19 state the three types of natural selection and how they operate.
2.20 explain how species arise by allopatric and sympatric speciation.
2.21 name the kingdoms into which living things are grouped.
2.22 list contributions of microorganisms to life on earth.
2.23 describe the life cycle of plants.
2.24 identify the characteristics of the major groups of plants.
2.25 identify the characteristics of the major groups of animals.
2.26 summarize the structure and function of vertebrate organ systems as studied in class.

3. AWC GENERAL EDUCATION (GE) CATEGORY & CRITERIA
NATURAL SCIENCES

- How to describe, explain, and predict natural phenomena using scientific, logical, and quantitative reasoning and empirical evidence from observation and experimentation
- The use of experimentation and/or observation to study natural phenomena, using the scientific method
- The history of scientific development
- How to critically evaluate scientific information, including visual displays and quantitative data
- How the tools and techniques of the natural sciences are applied to global and local issues such as sustainability, climate change, etc.
- The importance of examining assumptions about the natural world and the implications those assumptions have for individual and societal decisions

3. METHODS OF INSTRUCTION
3.1 Lecture
3.2 Laboratory exercises
3.3 Slide presentations
3.4 Films
3.5 Classroom demonstrations
3.6 Student discussion
3.7 CD-ROM and Internet activities

4. LEARNING ACTIVITIES
4.1 Lecture on the biological principles of life
4.2 Guest speakers when available and relevant
4.3 Audio-visual materials when appropriate
4.4 Recitation, class discussion, questions and answers to augment the lecture
4.5 Internet explorations to augment lecture
4.6 CD-ROM as available
4.7 A 500-word research paper is required on a biological or environmental topic related to the course material as specified by your instructor
4.8 Laboratory investigation through:
4.8.1 Examination of preserved materials
4.8.2 Viewing of microscopic preparations
4.8.3 Examination of models
4.8.4 Demonstrations by the instructor where applicable
4.8.5 Experimentation to correlate with lecture material

5. EVALUATION
5.1 Quizzes
5.2 Exams

5.3 Research Paper

7. STUDENT RESPONSIBILITIES

7.1 Under AWC Policy, students are expected to attend every session of class in which they are enrolled.

7.2 If a student is unable to attend the course or must drop the course for any reason, it will be the responsibility of the student to withdraw from the course. Students who are not attending as of the 45th day of the course may be withdrawn by the instructor. If the student does not withdraw from the course and fails to complete the requirements of the course, the student will receive a failing grade.

7.3 Americans with Disabilities Act Accommodations: Arizona Western College provides academic accommodations to students with disabilities through AccessABILITY Resource Services (ARS). ARS provides reasonable and appropriate accommodations to students who have documented disabilities. It is the responsibility of the student to make the ARS Coordinator aware of the need for accommodations in the classroom prior to the beginning of the semester. Students should follow up with their instructors once the semester begins. To make an appointment call the ARS front desk at (928) 344-7674 or ARS Coordinator at (928) 344-7629, in the College Community Center (3C) building, next to Advising.

7.4 Academic Integrity: Any student participating in acts of academic dishonesty—including, but not limited to, copying the work of other students, using unauthorized "crib notes", plagiarism, stealing tests, or forging an instructor's signature—will be subject to the procedures and consequences outlined in AWC's Student Code of Conduct.

7.5 Texts and Notebooks: Students are required to obtain the class materials for the course.

7.6 Arizona Western College students are expected to attend every class session in which they are enrolled. To comply with Federal Financial Aid regulations (34 CFR 668.21), Arizona Western College (AWC) has established an Attendance Verification process for "No Show" reporting during the first 10 days of each semester.

Students who have enrolled but have never attended class may be issued a "No Show" (NS) grade by the professor or instructor and receive a final grade of "NS" on their official academic record. An NS grade may result in a student losing their federal financial aid.

For online classes, *student attendance in an online class is defined as the following* (FSA Handbook, 2012, 5-90):

- Submitting an academic assignment
- Taking an exam, an interactive tutorial or computer-assisted instruction
- Attending a study group that is assigned by the school
- Participating in an online discussion about academic matters
- Initiating contact with a faculty member to ask a question about the academic subject studied in the course