ARIZONA WESTERN COLLEGE
SYLLABUS

BIO 181 GENERAL BIOLOGY (MAJORS) I/GE
Credit Hours: 4 Lec: 3 Lab: 3
SUN# BIO 1181

PREREQUISITE: None
NOTE: One year of high school chemistry or one semester of college-level chemistry recommended.

NOTE: Credit cannot be received in both BIO 100 and the BIO 181-182 sequence.

COURSE DESCRIPTION
Principles of structure and function of living things at the molecular, cellular, and organismic levels of organization. Includes molecular and cellular biology, genetics, and viruses.

1. COURSE GOALS
   - 1.1 BIO 181 is the first semester of a two semester introductory biology sequence (General Biology I and General Biology II) which is intended for students majoring in the life sciences. BIO 181 is a prerequisite of BIO 182.
   - 1.2 BIO 181 introduces the study of molecular and cellular levels of biology and genetics. BIO 182 includes the topics of evolution, the diversity of life, ecology, and the structure and function of bacteria, archaea, protists, fungi, plants and animals.
   - 1.3 Successful completion of BIO 181 - BIO 182 sequence will provide students with a firm background to pursue upper division biology courses at the university level.
   - 1.4 The two-course sequence will transfer to the state universities to fulfill core requirements in the biological sciences.
   - 1.5 This course emphasizes the methods of science and a global view of ecological processes.
   - 1.6 Improvement of student writing skills is addressed through a research assignment, essay style exam questions, and written laboratory assignments.
   - 1.7 Students cannot receive academic credit for both BIO 100, Biology Concepts, and the BIO 181-182 sequence.

2. OUTCOMES
   Upon satisfactory completion of this course, students will be able to:
   - 2.1 Describe the nature of science and the experimental method and design an experiment using the processes of scientific inquiry.
   - 2.2 Describe the characteristics that distinguish life from nonliving matter and identify the similarities that unite all organisms despite the great diversity of life on Earth.
   - 2.3 Explain how life is organized from the subatomic level up to the levels of the ecosystem and biosphere.
   - 2.4 Explain the interdependence of all species and the importance of biological diversity in the functioning of the biosphere.
   - 2.5 Describe the basic structure of atoms and molecules making up physical matter, and discuss how life processes obey the same fundamental properties of matter and energy that control nonliving matter.
   - 2.6 Compare and contrast the basic structure of carbohydrates, lipids, proteins, and nucleic acids, and explain the biological significance of each.
   - 2.7 Identify the parts of a cell, describe the structure and function of each, and describe how the parts of cells function together to form a basic living unit.
   - 2.8 Describe the role of enzymes in metabolism.

2.9 Summarize the major steps of the metabolic reactions of photosynthesis and respiration, explain their significance, and compare them.
2.10 List the steps in cell reproduction during mitosis and meiosis and distinguish between the functions of these two processes.
2.11 Describe the basic patterns of inheritance of genetic traits and solve genetic problems illustrating different mechanisms of inheritance and probability.
2.12 Explain the molecular basis of genetics, how genes function, the structure and function of DNA and RNA, and the process of protein synthesis. Infer the protein sequence encoded by a given DNA strand.
2.13 Describe the process of "genetic engineering," and discuss the ethical and environmental concerns surrounding present day research in biotechnology.
2.14 Describe how living organisms are classified into taxonomic groups.
2.15 Describe the major characteristics of viruses and discuss their importance and impact on health, biotechnology, and ecosystems.
2.16 Determine the tonicity of a cell, the resulting net movement of water, and differentiate between mechanisms of cellular transport.
2.17 Demonstrate knowledge of laboratory safety skills and procedures.
2.18 Operate light microscopes, prepare wet-mount slides, and use stains.
2.19 Perform laboratory activities using relevant laboratory equipment, chemical reagents and supplies to observe biological specimens, measure variables, and to design and conduct experiments.
2.20 Demonstrate the ability to use pipettes and other volumetric measuring devices, chemical glassware, balances, pH meters or test papers, spectrophotometers or thermocyclers, separation techniques, such as chromatography or electrophoresis to perform activities relevant to other course outcomes.
2.21 Analyze and report data generated during laboratory experiments and activities.

3. AWC GENERAL EDUCATION (GE) CATEGORY & CRITERIA
NATURAL SCIENCES
3.1 How to describe, explain, and predict natural phenomena using scientific, logical, and quantitative reasoning and empirical evidence from observation and experimentation.
3.2 The use of experimentation and/or observation to study natural phenomena, using the scientific method.
3.3 How to critically evaluate scientific information, including visual displays and quantitative data.
3.4 How the tools and techniques of the natural sciences are applied to global and local issues such as sustainability, climate change, etc.

4. METHODS OF INSTRUCTION
4.1 Lectures
4.2 Laboratory exercises
4.3 Slide presentations
4.4 Videos
4.5 Classroom demonstrations
4.6 Discussion
4.7 Research assignment
4.8 Internet activities

5. LEARNING ACTIVITIES
5.1 Students read assigned course material and attend lecture and laboratory meetings.
5.2 Demonstrations, audio-visual materials, videos, discussion, and internet activities are utilized as appropriate.
5.3 Students often work cooperatively during laboratory activities.
5.4 A written research project is required.

6. EVALUATION
6.1 Laboratory exercises
6.2 Semester exams
6.3 Quizzes

6.4 Final Exam

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