

COURSE PROFICIENCY OUTLINE

BIOLOGY 1 = 362

College Prep

5 Credits

Purpose

Biology I - 362 is offered primarily to sophomores following the successful completion of a course in Earth-Space Science or General Science. Previously learned science skills, basic skills, and science understandings will be utilized in the course. The outcomes of the course will include the development of the students' knowledge of biology, of our resources, and of the impact of science on everyday life.

I. Student Outcomes 5.1, 5.3, 5.4, 5.5

- A. Students will demonstrate an understanding of the terminology, facts, concepts, and applications of biology.
- B. Students will demonstrate the ability to utilize biology learnings and materials in everyday life and in the further learning of science.
- C. Students will demonstrate an understanding of biology and technology and the interrelationships of humankind, resources, energy and the environment.
- D. Students will develop competencies in study and learning skills, reading, writing, and listening skills, in basic science critical thinking skills, and in laboratory manipulative and investigative skills.

II. Content 5.1

- A. Introduction - Biology, an interaction
 - 1. Basic features of the living condition
 - 2. Tools of the Biologist; the microscope and stereoscope
 - 3. Fundamentals of the process of science thinking
 - 4. Humankind and the environment; populations, biotic and abiotic factors, biomes and succession
 - 5. The interrelationship of humankind, energy, and the environment - management of resources; pollution
 - 6. Science and related career ideas, concepts and information
- B. Classification and organization in Biology
 - 1. Historical development
 - 2. Simple models and examples; origins, adaptation and speciation
- C. Life processes and fundamentals of biochemistry
 - 1. Fundamentals of basic chemical principles
 - 2. Materials of life
 - 3. Fundamentals of photosynthesis, respiration and energy, fermentation, enzymes, simple applications
- D. Cell structure and function; microscopic organisms
 - 1. Cell theory
 - 2. Basic cell structure and physiology

3. Fundamentals of meiosis and mitosis, perpetuation, cellular reproduction and development; DNA model
4. Bacteria, algae, fungi, protozoa and viruses; applications
- E. Plants - a survey
 1. Nonvascular and vascular plants
 2. Angiosperms - structure and function
- F. Animals - an anatomical survey
 1. Structure and function; organization
 2. Systems - digestive, transport, respiratory, excretory, regulatory (nervous and chemical control systems), reproduction and development, support and locomotion, behavior, examples and applications
- G. Humans
 1. Major systems
 2. Functions of each system
- H. Heredity and genetics
 1. Historical development
 2. Fundamental genetics problems
 3. Fundamentals of chromosome theory and other concepts; DNA
 4. Simple applications
- I. Evolution
 1. Hypothesis for the origin of life
 2. Evidence for the theory of evolution
 3. Darwin's Theory
 4. Diversity of life from evolution

III. Activities and Materials

- A. Text - Miller - Biology
- B. Classwork
 1. Lectures, note-taking, discussions, demonstrations, audio-visual materials and regular tests and quizzes will be utilized.
 2. Biology learning skills such as reading, writing, listening, the obtaining, processing and reporting of information, and science learning skills will be utilized.
- C. Laboratory activities - developing an attitude toward safety
 1. Microscope and stereoscope use and techniques
 2. Observations of live materials
 3. Studies related to science process thinking skills
 4. Studies of scientific principles and their applications toward the course content
 5. Studies of basic organs, systems, organisms, structures and functions; dissection
 6. Studies of the interrelationships of organisms and their environment

- D. Assignments - to be carefully checked and reviewed by the teacher and students utilizing high school academic level reading, writing, and science organization and thinking skills.
 - 1. Readings - text and other sources, outlining and the organization of information
 - 2. Written answers to questions
 - 3. Laboratory and other reports utilizing varying techniques and methods
 - 4. Science study-learning assignments

IV. Evaluation

- A. Students will be expected to complete classwork and homework learning assignments, laboratory work and reports on time, and make up missed work whenever it is practical to do so.
- B. Students will be expected to demonstrate an acceptable level of proficiency in all of the goals and objectives of the course within the previously defined content and process areas.
- C. The evaluation of student proficiencies shall consist of tests and quizzes, written assignments and reports, lab reports, and the teacher's regular observations of student's proficiencies, involvement and learnings in laboratory activities and in the classroom environment.
- D. Students will take a comprehensive final examination. This exam will count as 20% of the final grade.
- E. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.