

SYLLABUS

COURSE # AND TITLE: BIOL 121, Introductory Biology I
OF CREDITS: 4 (3+2P)

CATALOG DESCRIPTION

This course is an introduction to the basic processes of living organisms. Topics to be covered will include cell structure and function, cellular reproduction, metabolism, photosynthesis, the basic chemical processes, introductory biochemistry, energetics, enzyme structure and function, protein synthesis and basic Mendelian genetics.

Semester Offered: Fall, Spring and Summer

Prerequisites: Reading: CPT score of 58 or better or successful completion of RDNG 095;
English: CPT score of 70 or better or successful completion of ENGL 099; Math: CPT score of 66 or better or successful completion of MATH 095.

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will....

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| <i>Learn</i> | <i>Students will actively and independently acquire, apply and adapt skills and knowledge to develop expertise and a broader understanding of the world as lifelong learners.</i> |
| <i>Think</i> | <i>Students will think analytically and creatively to explore ideas, make connections, draw conclusions, and solve problems.</i> |
| <i>Communicate</i> | <i>Students will exchange ideas and information with clarity and originality in multiple contexts.</i> |
| <i>Integrate</i> | <i>Students will demonstrate proficiency in the use of technologies in the broadest sense related to their field of study.</i> |
| <i>Act</i> | <i>Students will act purposefully, reflectively, and respectfully in diverse and complex environments.</i> |

GENERAL LEARNING OBJECTIVES

Upon completion of the course, the student should understand the following content areas:

- 1.) the basic biochemistry of life.
- 2.) cell structure and function.
- 3.) cellular respiration and energetics.
- 4.) protein synthesis.
- 5.) genetics.

SPECIFIC LEARNING OUTCOMES

Upon successful completion of the course, the student will be able to:

1. describe properties associated with life;
2. diagram and explain electron configurations of given elements and how they influence the chemical behavior of atoms;
3. distinguish between non-polar covalent, polar covalent and ionic bonds;
4. explain the five characteristics of water that are properties resulting from hydrogen bonding, and how water contributes to the fitness of the environment to support life;
5. explain how carbon's electron configuration determines the kinds and number of bonds carbon will form as well as how this configuration contributes to the diversity and complexity of organic molecules;
6. describe the unique properties, building block molecules and the biological importance of the four major classes of biomolecules (carbohydrates, lipids, proteins and nucleic acids);
7. identify and distinguish between the cellular structure and function of both prokaryotic and eukaryotic cells and their component parts;
8. diagram the structure and describe the biochemistry of the phospholipid membrane and how it influences cellular transport;
9. predict how biological molecules will behave in relation to phospholipid membranes;
10. illustrate and outline the importance of energy and how it is exchanged in the catabolic and anabolic pathways of cellular metabolism;
11. define the First and Second Laws of Thermodynamics;
12. explain the function of enzymes and catalysts in relationship to cellular metabolism;
13. describe the significance of ATP and its relationship to cellular metabolism;
14. define oxidation and reduction and explain how redox reactions are involved with energy exchanges at a cellular level;
15. diagram and explain the processes of carbohydrate cellular respiration including Glycolysis, the Krebs Cycle, the Electron Transport Chain and Fermentation;
16. diagram and explain the pathways of photosynthesis: both Light and Dark reactions;
17. differentiate between cell division in prokaryotes and eukaryotes;
18. list the stages of the cell cycle;
19. distinguish between asexual and sexual reproduction;
20. describe and diagram the sequence of events that occur during each stage of mitosis and meiosis, and distinguish between the functions of each;
21. list the sources of genetic variation;
22. examine the key details in Mendel's experiments that enabled him to postulate the laws of inheritance and recall and apply those laws;
23. describe monohybrid and dihybrid crosses to determine genotypic and phenotypic ratios according to Mendel's laws;
24. describe protein synthesis;
25. predict the sequence of amino acids in proteins based on the genetic code;

Syllabus developed by _____ Date: _____

Syllabus reviewed by _____ Date: _____

A current syllabus must be on file in the dean's office for every course being taught during a given semester.