

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE

COURSE SYLLABUS

Course Title: General Biology I

Course #: Bio 121

Course Description:

This course serves as an introduction to college biology and as a foundation for other biological science courses. Students will acquire knowledge of the fundamental principles of biology including cell structure and function, genetics and evolution. 4 credits

Pre-requisite:

Science 099 or equivalent and successful completion of Eng 063 and Eng 073 or satisfactory placement test scores. Computer skills, including email, word processing, and web navigation **are critical** for this course.

Goals:

The goal of this course is to provide students with an understanding of the fundamental principles of biology including cell structure and function, genetics and evolution.

Outcomes:

Upon the completion of this course, students should be able to Describe:

1. the steps in the scientific method
2. atomic structure, bonding and molecules.
3. the structure of water, its characteristics and significance to life.
4. catabolism, hydrolysis, anabolism, synthesis, polymer and monomer.
5. and differentiate between the molecular structure of carbohydrates, lipids, proteins and nucleic acids, and provide examples of each and the role they play in the cell.
6. the structure of enzymes and their role in metabolism.
7. the function and location of eukaryotic cell organelles: E.R., Golgi, lysosome, nucleus, ribosomes, centrioles, flagella, cilia, microtubules, microfilaments, cell walls
8. the molecular structure of the cell membrane using the fluid mosaic model and describe the following methods of membrane transport: endocytosis, exocytosis, diffusion, osmosis, and active transport.
9. the structure and function of membrane receptors in cell interactions and the processes of cell signaling and signal transduction.
10. the pathways of glycolysis, Krebs's Cycle and Oxidative Phosphorylation.
11. the light dependent and light independent reactions of photosynthesis.
12. the structure of chromosomes including chromatin, chromatid, centromere, histone and nucleosomes
13. diploid, haploid, and homologous chromosomes,
14. Explain Mendel's first law (Law of Segregation) and second law (Law of Independent Assortment).
15. and Define the following terms: gene, allele, locus, dominant, recessive, codominant, phenotype, genotype, homozygous, and heterozygous.
16. and Explain sex-linked traits and autosomal traits.
17. and Deduce genotypes and probability for dominant, recessive, co-dominant, multiple alleles, and sex-linkage
18. the structure of DNA, complementary base pairing, and DNA replication.

19. and Explain the gene-protein relationship; give the details of transcription, post transcriptional modification, and translation.
20. the control of gene expression at the transcriptional level in prokaryotes and eukaryotes
21. and Define the terms promoter, operon and operator.
22. gene mutations, and chromosomal aberrations providing examples in human and animals
23. the cell cycle and the relationship between mutations in cell cycle control and cancer.
24. and Explain some of the current techniques used for DNA Technology including DNA fingerprinting and polymerase chain reaction.
25. and Explain the scientific evidence that supports the theory of evolution.
26. Darwin's role in the formation of the theory of evolution.
27. Define the terms natural selection and fitness and identify the different forces of natural selection.
28. and Explain the role of genes in evolution and speciation and demonstrate the use of the Hardy-Weinberg Principle.

College Policies

Plagiarism: Plagiarism and Academic Dishonesty are not tolerated at Northwestern Connecticut Community College. Violators of this policy will be subject to sanction. Please refer to your “Student Handbook” under “Policy on Student Rights,” the Section entitled “Student Discipline,” or the College catalog for additional information.

Americans with Disabilities Act (ADA): The College will make reasonable accommodations for persons with documented learning, physical, or psychiatric disabilities. Students should notify Roseann Dennerlein, the Counselor for Students with Disabilities. She is located at Green Woods Hall, in the Center for Student Development. Her phone number is 860-738-6307 (V/TTY) and her email is rdennerlein@nwcc.comnet.edu.

School Cancellations: If snowy or icy driving conditions cause the postponement or cancellation of classes, announcements will be made on local radio stations. Students may also call the College directly at (860) 738-6464 to hear a recorded message concerning any inclement weather closings. Students are urged to exercise their own judgment if road conditions in their localities are hazardous.