BSCI170: Principles of Molecular and Cellular Biology

Course Description:

BSCI170 will focus on the molecular and cellular basis for all life on this planet, covering fundamental processes that underlie nearly every aspect of organismal function, behavior, and evolution.

Some faculty members teach this class using a lecture format while others use an active-learning format (lectures and in-class activities). BSCI170C is the version of the course for biology majors only.

Prerequisites:

Must have math eligibility of MATH120 or higher

Course Credit: 3

Recommended: For Science majors.

Textbook:

Campbell Biology by Reece, Urry, Cain, Wasserman, Minorsky, and Jackson (9th or 10th Edition)

Major Topics Covered In BSCI170 Include The Following:

1. Basic Chemistry: Chemical Bonds, H_2O and Polarity
2. Functional Groups
3. Macromolecules, Carbohydrates, and Lipids
4. Structure and Function of Proteins
5. Structure and Function of DNA and RNA
6. Basic Organization of Cells
7. Membranes
8. Movement Across Membranes: Simple Diffusion, Passive Transport, and Active Transport
9. Endocytosis and Cell Signaling
10. Exocytosis and Protein Targeting
11. Enzymes, Equilibrium Constants, and Free Energy
12. Enzyme Kinetics and Coupled Reactions
13. Introduction to Metabolism
14. Metabolic Pathways: Glycolysis and the Citric Acid Cycle
15. Metabolic Pathways: The Respiratory Chain and Additional Pathways
16. Photosynthesis
17. Identifying DNA as the Genetic Material
18. DNA Replication
19. Transcription of DNA into RNA
20. Control of Gene Expression: Prokaryotes
21. Control of Gene Expression: Eukaryotes

22. Maturation of RNA
23. Translation and the Effect of Mutations
24. Genetic Engineering
25. Signal Transduction
26. The Cell Cycle and How Aberrations in the Cell Cycle Can Lead to Cancer