## BIOLOGY 311C

## INTRODUCTORY BIOLOGY I

Introduction to structure & function, energy flow, and the transmission & expression of genetic information in living systems.



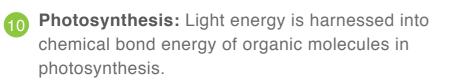
## **BIG IDEA I** STRUCTURE RELATES TO FUNCTION

- **Biological Hierarchy**: Biological systems are structured at many interrelated levels.
- **Chemistry for Biology**: The structure and properties of chemicals determine the behavior and functions of molecules in organisms.
- **Biological Molecules**: Cell components and cells and made up of biological molecules with specific chemical properties.
- **Origin of Life**: The first living cells originated by chemical evolution in pre-biotic Earth.
- Cell Structure: The structure of cells has evolved to perform a variety of essential functions.
- Biological Membrane: Cell membranes are selectively permeable barriers.
- Cell Communication: Cells communicate with each other and can convert environmental signals to complex integrated responses within a cell.



**BIG IDEA II** ENERGY IS TRANSFORMED TO SUSTAIN LIVING SYSTEMS

- Metabolism: Energy transfer and transformation is critical to all aspects of biology from cells to ecosystems.
- **Respiration:** Organic molecules are broken down in cellular respiration to make ATP.





**BIG IDEA III** GENETIC INFORMATION IS EXPRESSED AND TRANSMITTED



DNA Structure & Replication: DNA is the molecule of heredity in all organisms.

- Transcription & Translation: Genetic information flows from DNA to RNA to protein.
- Gene Regulation: Cells can regulate gene expression at many points during the process.
- Recombinant DNA: Scientists utilize knowledge of gene structure and regulation to express modified genes.

  - **Cell Cycle**: Mitosis is essential for growth, development and reproduction of somatic cells.
- Meiosis: Meiotic cell division leads to gamete formation, generates genetic variability and transmits alleles from one generation to the next.

## **CORE COMPETENCIES**

