

# Biology Overview

## I. Introduction to Biology

1. Studying Biology
  - A. Biology & Biologists
2. Chemistry of Living Things
  - A. Elements, Atoms & Molecules
  - B. Water & Life
  - C. Acids, Bases & Buffers
  - D. Biochemistry

## II. The Cell

1. Cell Theory & Organization
  - A. The Basics
  - B. More about cells
2. Membranes and Transport
  - A. Cell membranes
  - B. Purification of hemoglobin
3. Cell Division
  - A. Cell Cycle and Mitosis
  - B. Cell division & cancer
4. Cell Energetics
  - A. Cellular energy currency
  - B. Enzymes as catalysts
  - C. Photosynthesis
5. Catabolic Pathways
  - A. Glycolysis
  - B. Cellular Respiration

## III. Genetics

1. DNA
  - A. DNA basics
  - B. DNA to protein
2. Genomes & Sexual Reproduction
  - A. Eukaryotic genomes

- B. Bacterial genomes
    - C. Sexual life cycle & Meiosis
  - 3. Inheritance, Genes & Chromosomes
    - A. Mendelian inheritance
    - B. Extensions of Mendel
    - C. Genes & Chromosomes
  - 4. Biotechnology
    - A. Principles of biotechnology
    - B. Applications
- IV. Evolution, Taxonomy & Microorganisms
  - 1. Darwin & Evolution
    - A. Darwin in History
    - B. Mechanisms of evolution
    - C. Population Genetics
  - 2. Origins of the Species
    - A. Speciation
  - 3. Taxonomy and Classification
    - A. Systematics
    - B. History of Life
  - 4. Microorganisms
    - A. Viruses
    - B. Prokaryotes
    - C. Unicellular eukaryotes
- V. Plant Biology & The Fungi
  - 1. Fungi & Plant Evolution
    - A. The fungi
    - B. Plant evolution
  - 2. Plant Structure & Nutrition
    - A. Plant structure
    - B. Plant nutrition
  - 3. Plant Reproduction, Development & Control
    - A. Plant reproduction & development

B. Plant control

VI. Animal Biology

1. Introduction to animals
  - A. Animal diversity
  - B. Animal form & function
2. Animal Systems I
  - A. Skeletons & muscles
  - B. Circulatory & respiratory systems
3. Animal Systems II
  - A. Nervous systems
  - B. Endocrine system
  - C. Reproduction & development
4. Animal Systems III
  - A. Digestive and waste systems
  - B. Body defenses

VII. Environmental Biology

1. Ecology & Conservation
  - A. Ecology
  - B. Ecosystems
  - C. Conservation biology