

# **Study Guide: Highlights and Themes from Midterm #1 Lecture Series**

## **Lecture Series 1 – Evolutionary Framework**

Overview of Biology  
Evolutionary Milestones  
Biological Diversity  
Fundamental Concepts  
    Emergent Properties  
    Hierarchical Organization  
Endosymbiosis and Complexity  
Habitable Zones in our Solar System

## **Lecture Series 2 – Biologically Important Macromolecules**

Condensation/Dehydration or Hydrolysis Reactions  
Macromolecules vs. Polymers  
    Lipids  
    Carbos  
    Proteins  
    Nucleic Acids  
Bonds/Linkages for each!  
Proteins  
    Structures and Functions  
    Folding  
    Interactions

## **Lecture Series 3 – The Organization of the Cell**

Cell Theory  
Surface Area to Volume Ratios  
Compare and Contrast Prokaryotes with Eukaryotes  
Compare and Contrast Plant Cells with Animal Cells  
Organelles

Structures and Functions  
Endomembrane System  
    e.g., From Signal Sequence to Oligosaccharide in a Glycoprotein  
Cytoskeleton  
    Whose Who and What Do They do?  
    Motor Proteins and How They Work  
Extracellular Structures of Plants and Animals

## **Lecture Series 4 – Cellular Membranes**

Membrane Composition and Structure  
Animal Cell Adhesion  
Passive Processes of Membrane Transport  
    Osmosis, Which Way Does It Flow?  
Active Transport of Membrane Transport  
    Primary vs Secondary  
Endocytosis and Exocytosis  
    Receptor-Mediated Endocytosis