

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

Lecture Series 5 – Cell Cycle & Cell Division

Bacterial Cell Division
The Eukaryotic Cell Cycle
Cell Cycle Control
 Internal and External
Organization of Chromosomes
 Levels of Packing
 Histones
Mitosis = Cloning
 All the steps
 Cytokinesis in Animal vs Plant Cells
 Evolutionary Development Issues