The following lecture schedule contains links to the book sections from Biology from OpenStax College (CC-BY 4.0) Readings are organized into 4 units that cover the material for the 4 exams in the course.

- **Unit 1**
- **Unit 2**
- **Unit 3**
- **Unit 4**

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<td><strong>THE ORIGIN &amp; EVOLUTION OF LIFE</strong></td>
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<td>Oxidation and Reduction</td>
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INORGANIC CHEMISTRY II
4. Elements, Compounds, Molecules and Mixtures
   Bonds: Weak and Strong

WATER & pH
III  5. Importance and Properties of H₂O
   Acids, Bases, pH, Buffers

ORGANIC CHEMISTRY
6. Importance of Carbon
   Organic vs. Inorganic Compounds
   The Hydrocarbons
   Functional Groups
   Isomers

EXAMINATION I (Lectures 1-6 inclusive)

MACROMOLECULES I
8. Monomers and Polymers
   Dehydration Synthesis and Hydrolysis
   Carbohydrates
   Lipids

MACROMOLECULES II
9. Proteins
   Nucleic Acids
   ATP
   Enzymes and Metabolic Pathways

CELLS
10. The Cell Theory
    Methods of Studying Cells
    Cellular Size Limitations
    Cell Composition
    Prokaryotic and Eukaryotic Cells
    Cellular Evolution
    Anaerobic and Aerobic Cells; Endosymbiosis;
    Multicellularity; Viruses, Bacteria and Archaea
VI 11. THE EUKARYOTIC CELL
   Eukaryotic Cell Structure and Function
   Eukaryotes

   MEMBRANES & TRANSPORT
   Membrane Structure and Function
   Membranes

   12. Passive Transport Processes
       Active Transport Processes
       Cell Surface Modifications

VII 13. Examination II (Lectures 8-12 inclusive)

   ENERGY
   Cells and the Flow of Energy
   Energy

   14. Metabolic Reactions and Energy Transformations
       Metabolic Pathways
       Oxidation and Reduction

VIII 15. CELLULAR RESPIRATION I
   Cellular Respiration (Anaerobic)
   Glycolysis and Fermentation

   Outside the Mitochondria: Glycolysis
   Fermentation

   CELLULAR RESPIRATION II
   Cellular Respiration (Aerobic)
   Aerobic Respiration

   Inside the Mitochondria:
   The Preparatory Reaction (Hub)
   Citric Acid Cycle (TCA)
   Electron Transport Chain (ETC)
   Metabolic Pool

IX 17. PHOTOSYNTHESIS I
   Photosynthetic Organisms
   Light Capture

   The Process of Photosynthesis
   Plant as Solar Energy Converters: Light Reactions

PHOTOSYNTHESIS II

   18. Dark Reactions: Calvin Cycle Reactions (Carbon Fixation)
       Other Types of Photosynthesis
       Carbon Fixation
ASEXUAL REPRODUCTION
The Cell Cycle and Its Control
Mitosis and Cytokinesis
The Cell Cycle and Cancer
Prokaryotic Cell Division

SEXUAL REPRODUCTION
Halving the Chromosome Number
Genetic Variation
20. The Phases of Meiosis
Comparison of Meiosis and Mitosis
The Human Life Cycle (Spermatogenesis & Oogenesis)

CHROMOSOMES
Changes in Chromosome Number and Structure

Examination III (Lectures 14-21 inclusive)

GENETICS I
Gregor Mendel
Mendel’s Law
Human Genetics Disorders

GENETICS II
Extending the Range of Mendelian Genetics
Multiple Allelic Traits
Incomplete Dominance
Pleiotropy
Polygenic Inheritance
X-Linked Inheritance
Environmental Influences

DNA
The Genetic Material

DNA Structure
DNA Replication
Prokaryotic versus Eukaryotic Replication
GENE FUNCTION
The Genetic Code
Transcription
Translation
Structure of the Eukaryotic Chromosome

GENETIC REGULATION
Prokaryotic
Eukaryotic
Regulation Through Mutations

BIOTECHNOLOGY & GENOMICS
DNA Cloning
Biotechnology Products
Gene Therapy
Genomics

ANIMAL DEVELOPMENT
Early Developmental Stages
Developmental Processes
Human Embryonic and Fetal Development

Examination IV (Lectures 23-29 inclusive)