

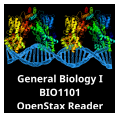
The following lecture schedule contains links to the book sections from [Biology](#) from OpenStax College ([CC-BY 4.0](#)) Readings are organized into 4 units that cover the material for the 4 exams in the course.

- [Unit 1](#)
- [Unit 2](#)
- [Unit 3](#)
- [Unit 4](#)

Week	Lectures	Topic with link to Openstax pages	Openlab Supplement
I	1.	BASICS Introduction to the Course Definition, Characteristics and Hierarchy of Life Scope of Ecology: Habitat, Population, Community, Ecosystem The Scientific Method Evolution and Classification Systematics, taxonomy, phylogeny	Biology Basics
	2.	THE ORIGIN & EVOLUTION OF LIFE Darwin & Evolution The Origin of Life The Geological Time Scale Cellular History Kingdoms and Domains	Evolution and Geological Time
II	3.	INORGANIC CHEMISTRY I Definition, Classification and Properties of Matter Atomic Structure The periodic Table Isotopes Electrons and Energy Energy Chemical Reactions: Exergonic and endergonic Activation Energy Oxidation and Reduction	Chemistry



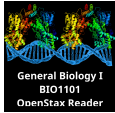
4. [INORGANIC CHEMISTRY II](#)
Elements, Compounds, Molecules and Mixtures
Bonds: Weak and Strong
- III 5. [WATER & pH](#)
Importance and Properties of H₂O
Acids, Bases, pH, Buffers [Water](#)
6. [ORGANIC CHEMISTRY](#)
Importance of Carbon
Organic vs. Inorganic Compounds [Organic](#)
The Hydrocarbons [Chemistry](#)
Functional Groups
Isomers
- IV 7. [Examination I](#) (Lectures 1-6 inclusive)
8. [MACROMOLECULES I](#)
Monomers and Polymers [Macromolecules](#)
Dehydration Synthesis and Hydrolysis [I](#)
Carbohydrates
Lipids
- V 9. [MACROMOLECULES II](#)
Proteins [Macromolecules](#)
Nucleic Acids [II](#)
ATP
Enzymes and Metabolic Pathways
10. [CELLS](#)
The Cell Theory [Cells](#)
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.	<u>THE EUKARYOTIC CELL</u> Eukaryotic Cell Structure and Function	Eukaryotes
	12.	<u>MEMBRANES & TRANSPORT</u> Membrane Structure and Function Passive Transport Processes Active Transport Processes Cell Surface Modifications	Membranes
VII	13.	<u>Examination II</u> (Lectures 8-12 inclusive)	
	14.	<u>ENERGY</u> Cells and the Flow of Energy Metabolic Reactions and Energy Transformations Metabolic Pathways Oxidation and Reduction	Energy
VIII	15.	<u>CELLULAR RESPIRATION I</u> Cellular Respiration (Anaerobic) Outside the Mitochondria: Glycolysis Fermentation	Glycolysis and Fermentation
	16.	<u>CELLULAR RESPIRATION II</u> Cellular Respiration (Aerobic) Inside the Mitochondria: The Preparatory Reaction (Hub) Citric Acid Cycle (TCA) Electron Transport Chain (ETC) Metabolic Pool	Aerobic Respiration
IX	17.	<u>PHOTOSYNTHESIS I</u> Photosynthetic Organisms The Process of Photosynthesis Plant as Solar Energy Converters: Light Reactions	Light Capture
	18.	<u>PHOTOSYNTHESIS II</u> Dark Reactions: Calvin Cycle Reactions (Carbon Fixation) Other Types of Photosynthesis	Carbon Fixation



		<u>ASEXUAL REPRODUCTION</u>	
X	19.	The Cell Cycle and Its Control Mitosis and Cytokinesis The Cell Cycle and Cancer Prokaryotic Cell Division	<u>Cell Cycle</u>
		<u>SEXUAL REPRODUCTION</u>	
	20.	Halving the Chromosome Number Genetic Variation The Phases of Meiosis Comparison of Meiosis and Mitosis The Human Life Cycle (Spermatogenesis & Oogenesis)	<u>Meiosis and Gametogenesis</u>
		<u>CHROMOSOMES</u>	
XI	21.	Changes in Chromosome Number and Structure	<u>Chromosomes</u>
	22.	<u>Examination III</u> (Lectures 14-21 inclusive)	
		<u>GENETICS I</u>	
XII	23.	Gregor Mendel Mendel's Law Human Genetics Disorders	<u>Mendelian Genetics</u>
		<u>GENETICS II</u>	
	24.	Extending the Range of Mendelian Genetics Multiple Allelic Traits Incomplete Dominance Pleiotropy Polygenic Inheritance X-Linked Inheritance Environmental Influences	<u>Non-Mendelian Genetics</u>
		<u>DNA</u>	
XIII	25.	The Genetic Material DNA Structure DNA Replication Prokaryotic versus Eukaryotic Replication	<u>DNA</u>



GENE FUNCTION

26. The Genetic Code
Transcription
Translation
Structure of the Eukaryotic Chromosome

[Gene structure and function](#)

GENETIC REGULATION

- XIV 27. Prokaryotic
Eukaryotic
Regulation Through Mutations

[Gene Regulation](#)

BIOTECHNOLOGY & GENOMICS

28. DNA Cloning
Biotechnology Products
Gene Therapy
Genomics

[Biotechnology and Genomics](#)

ANIMAL DEVELOPMENT

- XV 29. Early Developmental Stages
Developmental Processes
Human Embryonic and Fetal Development

30. [Examination IV](#) (Lectures 23-29 inclusive)