

Lect. No.	Chap. No.	Topic	Pages
1 2-3	--- 3	Introduction The Chemistry of Water 3.1. Polar covalent bonds in water molecules result in hydrogen bonding 3.2. Four emergent properties of water contribute to Earth's suitability for life - Assignment: Acidification: A threat to our oceans	92-98 101
4-8	5	Biological Macromolecules and Lipids 5.1. Macromolecules are polymers, built from monomers 5.2. Carbohydrates serve as fuel and building material 5.3. Lipids are a diverse group of hydrophobic molecules 5.4. Proteins include a diversity of structures, resulting in a wide range of functions 5.5. Nucleic acids store, transmit, and help express hereditary information	114-134
9-14	7	Cell Structure and Function 7.1. Biologists use microscopes and the tools of biochemistry to study cells Assignment: Microscopes (focus on types and function) and cell fractionation. 7.2. Eukaryotic cells have internal membranes that compartmentalize their functions 7.3. The eukaryotic cell's genetic instructions are housed in the nucleus and carried out by the ribosomes. 7.4. The endomembrane system regulates protein traffic and performs metabolic functions 7.5. Mitochondria and chloroplasts change energy from one form to another 7.6. The cytoskeleton is a network of fibers that organizes structures and activities in the cell (In brief) 7.7. Extracellular components and connections between cells help coordinate cellular activities	163-191
15-17	8	Cell Membranes 8.1. Cellular membranes are fluid mosaics of lipids and proteins. 8.2. Membrane structure results in selective permeability 8.3. Passive transport is diffusion of a substance across a membrane with no energy investment 8.4. Active transport uses energy to move solutes against their gradients 8.5. Bulk transport across the plasma membrane occurs by exocytosis and endocytosis	196-211
18-20	6	Energy and Life 6.2. The free-energy change of a reaction tells us whether or not the reaction occurs spontaneously 6.3. ATP powers cellular work by coupling exergonic reactions to endergonic reactions 6.4. Enzymes speed up metabolic reactions by lowering energy barriers 6.5. Regulation of enzyme activity helps control metabolism	141 145-159
21-25	10	Cell Respiration 10.1. Catabolic pathways yield energy by oxidizing organic fuels 10.2. Glycolysis harvests chemical energy by oxidizing glucose to pyruvate 10.3. After pyruvate is oxidized, The citric acid cycle completes the energy-yielding oxidation of organic molecules 10.4. During oxidative phosphorylation, chemiosmosis couples electron transport to ATP synthesis 10.5. Fermentation and anaerobic respiration enable cells to produce ATP without the use of Oxygen 10.6. Glycolysis and the citric acid cycle connect to many other metabolic pathways	236-256

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26-28	11	Photosynthetic Processes 11.1. Photosynthesis converts light energy to the chemical energy of food 11.2. The light reactions convert solar energy to the chemical energy of ATP and NADPH 11.3. The Calvin cycle uses the chemical energy of ATP and NADPH to reduce CO ₂ to sugar	259-274
29	12	Mitosis 12.1. Most cell division results in genetically identical daughter cells. 12.2. The mitotic phase alternates with interphase in the cell cycle. (The evolution of mitosis is <u>not included</u>)	284-293
30-31	13	Sexual Life cycles and Meiosis 13.1 Offspring acquire genes from parents by inheriting chromosomes. 13.2. Fertilization and meiosis alternate in sexual life cycles. (The variety of sexual life cycles is <u>not includes</u>) 13.3. Meiosis reduces the number of chromosome sets from diploid to haploid.	304-314
32-34	16	Nucleic Acids and Inheritance 16.1. DNA is the genetic material 16.2. Many proteins work together in DNA replication and repair (Evolutionary significance of altered DNA nucleotides and replicating the ends of DNA molecules are <u>not included</u>). 16.3 A chromosome consists of a DNA molecule packed together with proteins	364-382
35-39	17	Expression of Genes 17.1. Genes specify proteins via transcription and translation - Assignment: Nutritional mutations in Neurospora: Scientific Inquiry 17.2. Transcription is the DNA-directed synthesis of RNA: a closer look 17.3. Eukaryotic cells modify RNA after transcription (The functional and evolutionary importance of introns is <u>not included</u>) 17.4. Translation is the RNA-directed synthesis of a polypeptide: a closer look 17.5. Mutations of one or a few nucleotides can affect protein structure and function	385-410
40-42	26	Introduction to Viruses 26.1. A virus consists of a nucleic acid surrounded by a protein coat (Table 19.1 is <u>not included</u>) 26.2. Viruses replicate only in host cells (Evolution of viruses is <u>not included</u>)	608-617

COURSE TEXT BOOK: Campbell Biology 11th Ed. (2017). Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V. & Reece, J. B. Publisher: Pearson.