

AMB03 CELL BIOLOGY

UNIT-1 THE CELL

A macromolecular assembly, cellular compartmentalization, organelle architecture

UNIT-2 THE NUCLEUS

Chromosomal DNA and its Packaging, The Global Structure of Chromosomes, Chromosome Replication, RNA Synthesis and RNA Processing, The Organization and Evolution of the Nuclear Genome.

UNIT-3 CYTOSKELETON

The Nature of the Cytoskeleton, Intermediate Filaments, Microtubules, Cilia and Centrioles, Actin Filaments, Actin-binding Proteins, Muscle.

UNIT-4 CELL JUNCTIONS, CELL ADHESION, AND THE EXTRACELLULAR MATRIX

Cell Junctions, Cell-Cell Adhesion, The Extracellular Matrix of Animals, Extracellular Matrix Receptors on Animal Cells- the Integrins, The Plant Cell Wall

UNIT-5 MEMBRANE STRUCTURE, TRANSPORT OF MOLECULES AND MEMBRANE EXCITABILITY

The Lipid Bilayer, Membrane Proteins, Principles of Membrane Transport, Carrier Proteins and Active Membrane Transport, Ion channels and Electrical Properties of Membranes

UNIT-6 PROTEIN SORTING AND VESICULAR TRAFFICKING IN THE CELL

The Compartmentalization of Higher Cells, The Transport of Molecules into and out of the Nucleus, The Transport of Proteins into Mitochondria and Chloroplasts, Peroxisomes, The endoplasmic reticulum., Transport from the ER through the Golgi Apparatus, Transport from the Trans Golgi Network to Lysosomes, Transport from the Plasma Membrane via Endosome: Endocytosis, The Molecular Mechanisms of Vesicular Transport and the Maintenance of Compartmental Diversity.

UNIT-7 CELL SIGNALING

General Principles of Cell Signaling, Signaling via G-Protein-linked Cell Surface Receptors, Signaling via Enzyme-linked Cell-Surface Receptors, Kinase Receptors, Structural Features of Trans-membrane Receptors, Hormone Receptor Interaction, Two-component signaling, Second messengers.

UNIT-8 CELL CYCLE AND DIVISION

The General Strategy of the cell Cycle, The Mechanics of Cell Division, The Early Embryonic Cell Cycle, Cell- Cycle control in Yeasts and Multicellular Animals.

UNIT-9 CANCER

Cancer as a Microevolutionary Process, Tumor cells, Proto-oncogenes and viral oncogenes, Tumor suppressor genes.

Reference Books

1. Molecular Biology of Cell by Albert et.al. John Wiley & Sons
2. The Cell by Cooper. ASM Press
3. Cell and Molecular Biology by Karp. John Wiley & Sons

