SUBJECT ZOOLOGY

4 YEAR UG SYLLABUS_CBPBU

MAJOR-2 - FUNDAMENTALS OF CELL BIOLOGY

(Difficulty Level-100)

Objectives:

- To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.
- To understand the functioning of cellular components to generate and utilize energy in cells.
- To list the distinguishing properties of cell adhesion molecules and cytoskeletons.
- To describe the major events of cell division that enable the genome of one cell to be passed on to two daughter cells.
- To understand the signalling pathways in cellular communication.

Mode of Teaching: L, P, T. (L = Lecture, P = Practical, T = Tutorial)

THEORY
(CREDITS 4)

1. Structural organisation of Prokaryotic and Eukaryotic cells; Fluid-mosaic model of plasma membrane structure; Cell junctions (Tight junctions, Desmosomes, Plasmodesmata, Gap junctions).
2. Structure and Function of intra-cellular organelle: Nucleus, Mitochondria, Lysosome, Peroxisome, Endoplasmic Reticulum & Golgi Apparatus & Ribosome.
3. Concept of: Chemi-Osmotic Hypothesis, Nuclear Pore Complex, Vesicular transport mechanism, Nucleosome & Membrane Transport (Active & Passive).
4. Cell Adhesion molecules (CAMs): Cadherins, Integrins, Immunoglobulin Superfamily & Selectins.
5. Cell Division: Mitosis, Meiosis, Cell cycle and its regulation.
6. Cytoskeleton: Microtubules, Microfilaments and Intermediate filaments.
7. Cell Signalling: Pathways (Membrane receptor & Nuclear receptor).

PRACTICAL
(CREDITS 2)

1. Preparation of temporary stained squash of onion root tip to study various stages of mitosis.
2. Study of various stages of meiosis in Grasshopper testis.
3. Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.
4. Study of human karyotype (normal and abnormal).