

CBO-403

CELL BIOLOGY AND GENETICS

Unit -I Cell Biology

Structure of model membrane, electrical properties and function of membrane. Lipid bilayer and membrane protein

Nucleus and nucleolar – ultra structure chemical nature, nucleolar chromosome.

Nuclear envelope: ultra structure and chemical nature, transport of material and pore complex.

Structural organization and function of intracellular organelles:

Plastids, Mitochondria, Cellwall, Golgibodies, Lysosomes, Peroxisomes.

Cell-divisions, Polytene chromosome, lampbrush chromosome and their importance.

Main Reference(s):

Verma P S and Agarwal (2006) *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology*. S Chand & Company Ltd., New Delhi (1st Multicolour Edition-Reprint).

Unit -II Genetics

Genetic interactions

Extra chromosomal inheritance:

Male sterility-origin, induction and application.

Paternal inheritance of chloroplast DNA and mitochondrial DNA.

Non chromosomal genes in *Chlamydomonas*.

Mitochondrial genetics – petite in yeast and poroky in *Neurospora*.

Unit -III Genetics

Chromosomal (genetic) mapping.

Molecular basis of spontaneous and induced mutation, Physical and chemical mutagens

Genetics of matrix characters:

Genes and quantitative characters.

Analysis of quantitative characters.

Mobile genetics:

Insertion sequences and transposons in Bacteria- AC-DS system.

Genetic control of cell division:

Regulation of mitotic cell cycle in Eukaryotes, cancerous cells, tumour inducing virus, Proto-oncogenes and cellular oncogenes.

Unit -IV Population Genetics

Principles of Mendelian genetics.

Hardy-Weinberg genetic equilibrium.

Factors affecting gene frequency - Natural selection.

Genetic polymorphism and Genetic drift.

Main Reference(s):

Strickberger M W (2005) **Genetics**, Prentice-Hall of India Pvt Ltd., New Delhi (3rd Edition-EEE).
Rastogi Veer Bala (1991-92) **A Text Book of Genetics**, Kedar Nath Ram Nath, Meerut (9th Revised Edition).
Singh B D (2001) **Plant Breeding-Principles and Methods**, Kalyani Publishers, Ludhiana (1st Edition's Reprint).

Main Reference(s):

Gupta P K (2005) **Genetics**, Prentice-Hall of India Pvt Ltd., New Delhi (3rd Edition-EEE).
Rastogi Veer Bala (1991-92) **A Text Book of Genetics**, Kedar Nath Ram Nath, Meerut (9th Revised Edition).
Verma P S and Agarwal (2006) **Cell Biology, Genetics, Molecular Biology, Evolution and Ecology**. S Chand & Company Ltd., New Delhi (1st Multicolour Edition-Reprint).

Other Reference(s):

Sambamurty (), **Genetics (2nd edition)**
Gupta P K (2007), **Genetics-classical to modern (1st edition)**