

Course Code	Course Title	C	H	I	E	T
17U5ZMC5	Genetics	5	5	25	75	100

### Objectives

- ❖ To acquire knowledge about the basic principles of heredity
- ❖ To assess the practical application of genetics
- ❖ To review the various genetic disorders in man and animals

### Learning Outcome

1. Understanding the basic concepts of Heredity
2. Acquiring knowledge on genetic disorders and Human genetics

#### Unit- I

Genetics-definition, theories of inheritance - preformation, epigenetic, particulate and germplasm, Mendelism-monohybrid and dihybrid experiments, Mendel's laws, Pedigree analysis, Gene interaction: non-allelic – epistasis, complete, incomplete and co-dominance, Pleiotropism and lethal genes, Multiple alleles: Blood grouping in man, Coat color in rabbits, Polygenic inheritance: Skin pigmentation in man.

#### Unit- II

Linkage in *Drosophila*, types of linkage-complete and incomplete, theories and factors affecting linkage, Crossing over- mechanism, theories, types and significance, Chromosome map-definition, Construction and factors affecting mapping.

#### Unit- III

Chromosomal theory, sex determination in man, Gynandromorphism, Sex-linked inheritance: color blindness and haemophilia in man, maternal inheritance- coiling of shell in snail and kappa particles in *Paramecium*.

#### Unit- IV

Mutation: Molecular basis of gene mutation, types of gene mutation, Mutagens: types and their mode of action. Genetic recombination: Bacteria – Transformation, Conjugation and Transduction, Bacteriophages - Lytic and Lysogenic cycle.

#### Unit- V

Human Genetics: Simple Mendelian traits, twins, chromosomal aberrations, inborn errors of metabolism, Syndromes - Klinefelter's, Turner's and Down's. Population Genetics: Hardy-Weinberg Law, factors affecting gene frequencies, Eugenics, Euthenics and Euphenics.

**Text Books**

1. Verma, P.S. and V. K. Agarwal. 2009, Genetics, S. Chand & Company Ltd, New Delhi.
2. Bhamrah, H.S. and C.M. Chaturvedi. 2001, A textbook of Genetics, Anmol Publications, New Delhi.
3. Basu, S.B. and M. Hossain. 2006, Principles of Genetics, Books and Allied, Kolkata.

**Reference Books**

1. Gardner, E. 1975, Principles of Genetics, 5th Ed, Canada, John Wiley and Sons Inc.
2. Strickberger, W. 1991, Genetics, 5nd Ed, Boston, Macmillan Pub. Co. Inc.
3. Sinnott, E.W., L.C. Dunn and T. Dobzhansky. 1973, Principles of Genetics, 4th Ed, Tata Mc Graw Hill Pub. Co. Ltd, New Delhi.