

# **AMBT04 GENETICS**

## **UNIT-1 GENETICS AND ORGANISM**

Genetics and human affairs, Genetics and Biology, Genes and Environment, Techniques of genetic analysis.

## **UNIT-2 CHROMOSOME THEORY OF INHERITANCE**

The chromosome theory of heredity, Sex chromosomes, Sex linkage, The parallel behavior of autosomal genes and chromosomes.

## **UNIT-3 MENDELIAN ANALYSIS**

Mendel's laws of inheritance, Interaction of genes, Variations on dominance, Multiple alleles, Lethal alleles, Several genes affecting the same character, Penetrance and expressivity,

## **UNIT-4 LINKAGE**

Basic eukaryotic chromosome mapping, The discovery of linkage, Recombination linkage symbolism, Linkage of genes on X chromosomes, Linkage maps, Three point testcross, Interference, Calculating recombinant frequencies from selfed dihybrids, examples of linkage maps, The X2 test mitotic segregation in humans.

## **UNIT-5 FINE STRUCTURE OF GENES**

The concept of promoter, Coding sequence, Terminator, Induction of gene for expression.

## **UNIT-6 RECOMBINATION IN BACTERIA AND VIRUSES**

Conjugation recombination and mapping the E. coli chromosomes, Transformation, Transduction, Chromosome mapping.

## **UNIT-7 BIOCHEMICAL GENETICS**

Inborn errors of metabolism, one gene- one enzyme hypothesis, one gene-one protein, one gene - one polypeptide, colinearity

## **UNIT-8 THE EXTRANUCLEAR GENOME**

The concept of extra nuclear genome in higher plants and animals, Overview of mitochondrial genome, Chloroplast genome.

## **UNIT-9 POPULATION GENETICS**

Darwin's revolution, Variation and its modulation, The effect of sexual reproduction on variation, The sources of variation, Selection quantitative genetics

## **UNIT-10 PRINCIPLES OF PLANT BREEDING**

Objectives, Selfing and crossing techniques, Male sterility, Incompatibility, Hybrid vigour

## UNIT-11 HUMAN GENOME PROJECT

Genetic diseases in humans, Genetics and society.

### References Books

1. In Introduction to genetic analysis, Griffiths, Miller, Suzuki, Lewontin and
2. Gelbart, Freeman and Company.
3. Genetics, A.V.S.S. Sambamurty, Narosa Publishing House.
4. Concepts of Genetics, Klug & Cummings, Prentice Hall.
5. Molecular Cloning, Moniatisetal, Cold Spring Harbor Laboratory

