

PRINCIPLES OF GENETICS

GPBR 111

Credits 3(2+1)

Theory

Mendel's laws of inheritance and exceptions to the laws. Types of gene action - Multiple alleles – Pleiotropism – Penetrance and expressivity. Quantitative traits - Qualitative traits and differences between them - Multiple factor hypothesis. Cytoplasmic inheritance - it's characteristic features and difference between chromosomal and cytoplasmic inheritance. Mutation - it's characteristic features - Methods of inducing mutations and C / B technique. Gene expression and differential gene activation. Lac operon and Fine structure of Gene.

Ultra structure of cell and cell organelles and their functions. Study of chromosome structure, morphology, number and types - Karyotype and Idiogram. Mitosis and meiosis - their significance and differences between them. DNA and it's structure, function, types, modes of replication and repair. RNA and its structure, function and types. Transcription – Translation - Genetic code and outline of protein synthesis. Crossing over - Factors affecting it - Mechanism of crossing over and Cytological proof of crossing over. Linkage - Types of linkage and estimation of linkage. Numerical chromosomal aberrations (Polyploidy) and evolution of different crop species like Cotton, Wheat, Tobacco, Triticale and Brassicas. Structural chromosomal aberrations.